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JOURNAL
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Volume 13 MAY, 1938 Number 3

Integration of the Teaching of Psychology and Psychiatry*

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I must begin with a remark as to definition. Integration is defined as the formation of a whole from constituent parts. We read, on the one hand, of a psychologic leader who wrote that the psychiatrist can get along without psychology. On the other, we read that "as matters stand now, some psychiatrists hold that they would rather not have any psychology taught to intending medical students." In view of this, we are forced to wonder what are the constituent parts with which we shall deal and how do you spell "whole."

To me, the fixed part of the problem is psychiatry. May we begin by giving some definition of this field of debatable connotation. Gone forever are the days when a psychiatrist, in his chief responsibility to a patient, sat with his feet on a fumed oak desk and answered the questions of suspicious relatives. He could always assure the relatives, who repeated their complaints too frequently, that "the poor lad, you know, suffers from delusions and his weird stories are not to be taken too seriously." He could be sure that iron bars, stone walls and sturdy attendants would effectively answer the questions of the too insistent patient. He could make an initial examination, ennumerate the various symptoms, attend a case conference, and then forget the patient until his case came up for review and consideration for parole 6 months later. Of course, there was always the routine matter of assignment to the proper floor polisher, laundry or yard project.

With these conditions prevailing generally at the time the curricula of medical schools were undergoing revision and the standards of teaching raised, it is not surprising that in 1914, 5 out of 85 schools gave no instruction whatever in either neurology or psychiatry. In the remaining 80 schools, the average total hours allotted to the department of nervous and mental diseases was much less than the total hours recommended in the standard curriculum. It is true that instruction then, and now, in the so called "psychological aspects of disease" was not limited to the departments of nervous and mental diseases. However, that instruction relied on tools which were regarded by the psychologist as being

*Read at the Forty-eighth Annual Meeting of the Association of American Medical Colleges, held in San Francisco, October 25-27, 1937.

crude and unsatisfactory. But in harmony with the prevailing attitude, there was little dissatisfaction with the 10 to 20 hours allotted to psychiatry for instruction.

Into this situation of narrow, restricted, objective and descriptive psychiatry there came new concepts. In such laboratories of experimental psychology as were established by Wundt and others, new meaning was given to observed behavior. The application of the methods of scientific investigation to mental life and its problems resulted in the increasing conviction among psychiatrists that the disturbed behavior which they observed might mean something. A new interest developed and when new symptoms were reported to the front office, the order now went out to the back wards to "look him up" instead of to "lock him up." It had been deemed sufficiently accurate to note that a patient had delusions of grandeur or that he had hallucinations, or some other mental abnormality. The introduction of experimental methods made it evident that certain conditions which were superficially alike might be fundamentally different from a psychologic point of view. Further, it made it evident that the division between psychoneuroses and insanities was less marked than had been supposed.

This related everyone more closely to the problems of mental disorders and in the pursuit of his studies the psychiatrist began to emerge from behind the stone walls. He began to study the patients by the correct and critical recording of the plain facts of conduct and behavior. Because he had clinical responsibility for his patients, he began to regard each patient as his own experiment in nature. He began to study this experiment, not in the final stage of disorganized behavior but in the setting in which the disorganization developed. He noted the types of reaction, the conditions under which they occurred, the factors that modified them and led to an apparent self-adjustment or to further difficulty.

The study of these factors, or reagents if you will, required a new technique. If the patient is to be regarded as an experiment in nature, scientific principles require that the physician know the conditions under which the experiment is performed. He must know the original endowment or reagents. He must know the intensity of influences which affect that original endowment. Infections and metabolic disorders operating within the patient; economic, academic and social stress affecting the patient in his external relationships. He must know the time at which and during which the influences were operative. He must know of the presence of catalytic agents which serve to modify the reaction.

These concepts have affected a considerable change in the educational requirements of the medical student. The teaching of psychiatry traditionally consisted in the presentation of a few definitions of terms and a few strikingly different patients who exhibited the most bizarre behavior. This presentation usually took place in the senior year. An appraisal of these methods by the Division of Psychiatric Education of the National Committee for Mental Hygiene, in 1931, revealed that in 44 of 60 medical colleges visited, the teaching of psychiatry was considered inadequate according to generally accepted minimum standards. These minimum standards required that the curriculum be so ar-

ranged that there would not be the common separation of somatic and mental sciences. It required that the student accept the general dictum that he is dealing with a person and not a disease and that he develop a broader social viewpoint and attitude toward medicine in general. It required that psychiatry be taught not as a specialty but as a part of medicine as a whole. This means an earlier introduction into the curriculum, introduction at a time when the attitudes toward clinical medicine are being formed. Psychobiology, or the study and understanding of man in action has become an accepted part of his training.

From the psychiatrist's standpoint, what does he desire the student to have in his premedical training that will best prepare him to enter on this study? I have conferred with members of the Advisory Committee of the Division of Psychiatric Education of the National Committee for Mental Hygiene. The following is a summary of these conferences. We believe that he should have an outline of the dynamic system of the personality and the various life situations to which it has to adjust itself. He should know the characteristic modes of adaptation. He should have a knowledge of the essential biologic factors with regard to function and structure. In this biologic approach, special emphasis should be placed on the reactive patterns of the organism formerly known as instincts. He should have a fair picture of the development of the human personality, emphasizing the principle of the conditioned reflexes and showing how action and interaction between children, parents and siblings is interwoven into the structure of the maturing personality. He should recognize the conflict between the different reactive patterns and the various solutions of these conflicts which give a stamp to the maturing personality. He would, then, come to know the part played in the later reactions of this person by over-affection or denial of affection, by the rivalry between children, by the reaction to success and failure, by the balance between daydreaming and the output of energy, by the special rôle played by the bonus of pleasure and by the special complication introduced by the factor of sex with not only its bonus of pleasure but with its social complications.

He should know of the different types of individuals and the different ways in which they deal with reality. He should know the importance to the individual of the establishment of harmony within his personality, the expression of his natural endowment with the resultant satisfaction in the attainment of a certain status with his fellows, the manifestations of the expression of power, the development of social contacts and the satisfaction of the craving for affection and love. He should have a knowledge of the special technics by which these personality functions are measured.

I have indicated some of the needs. Dr. Stone and Dr. Rees will continue the discussion, indicating how the needs may be met.

Integration of the Teaching of Psychology and Psychiatry*

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A common obstacle standing in the way of integrating the contents of two or more academic disciplines is the learners' dearth of information on one or the other of these subjects. This obstacle has been discussed frequently by teachers of psychology and supervisors of the training of practice teachers preparing for work in the primary and secondary schools. For many years the majority of prospective teachers received only incidental contacts with the subject matter of general, child and adolescent psychology, and virtually no training in the applications of psychology to pedagogy. While this condition prevailed, there could be no integration of the teaching of psychology and pedagogy, either from the point of view of the learner or that of the instructor. Unfortunately, this situation persisted for many years after departments of psychology were established in colleges and universities, despite much agitation on the part of professional educators, and no end of intramural discussion and "buckpassing" within the rank and file of teachers of psychology and pedagogy.

Then followed a period in which psychology was prescribed as a part of the curriculum for teachers. At first, but few systematic attempts were made by psychologists to ascertain either the immediate or the ultimate objectives of professional educators. And, on the part of the latter, there was little or no inclination to become informed as to the usable psychological information possessed by prospective teachers at various stages of their progress, or to utilize it in directing young teachers in the acquisition of well balanced psychological attitudes for their everyday contacts with pupils as well as for instruction in specific school subjects. Prospective teachers seldom studied psychology with a forward regard for its applicability, and seldom had occasion for reviewing and supplementing it in concrete teacher-pupil situations. As might have been forecast, while unintegrated teaching of psychology and pedagogy prevailed, there was little, if any, difference between the effectiveness of well educated teachers who had taken several courses in psychology and those whose transcripts were unencumbered by psychological credits.

The solution of the dilemma implied in the foregoing example involves three major steps:

(1) Clarification of the ultimate aims in teacher functioning in the class room and in the community.

(2) Adequate provisions for preprofessional grounding in relevant psychological subject matter as well as in knowledge of the special teaching subjects.

(3) Recapitulation of psychological principles in connection with concrete

*Read at the Forty-eighth Annual Meeting of the Association of American Medical Colleges, held in San Francisco, October 25-27, 1937.

teaching problems; additional course work on the psychology of special school subjects; discussions of case records of typical personality abberations arising in the school; and some practical experience in disposing of the milder mental conflicts, by effective councilling or specialized teaching.

I believe that we do not make a serious mistake in assuming that many of the practical issues confronting us today in integrating the teaching of psychology and psychiatry are an epitome of those issues with which psychologists and professional educators have been, and, to some extent, still are confronted. The essence of this assumption has already been sensed by leaders in medical education, for in the recent literature may be found excellent statements of the ultimate aims of medical psychology. I refer particularly to articles by the psychologists Bott[1], Miles[2], and Wells[3] and the psychiatrists Ebaugh[4], Glover[5], Meyer[6] and Sadler[7], with which many of you, no doubt, are familiar. These authors envisage the future general practitioner as one prepared to recognize and treat the common varieties of personality maladjustments as well as the bodily ills of his patients. Sadler has said, "Many a doctor could make a good living out of the neurotics he turns away from his office each year." Obviously, if this condition is to be rectified, additional provisions for teaching the rudiments of medical psychology must be made or the practitioner of the future, as the practitioner of the present, will be unprepared to assume his responsibilities with respect to personality maladjustments of his clients.

In my opinion, the time to begin this preparation is during the second or third year of the premedical course.

1. What Courses in Psychology do Transcripts of Medical Students Show?

To the best of my knowledge, there are no available statistics on the courses in psychology taken by medical students of the United States. In order to have concrete data for our present discussion, I have collected information on this point from three classes of students now at Stanford University. The classes consist of premedical students, freshmen medical students and sophomore medical students. In virtually no instances have they taken psychology as a specific premedical requirement, although in some instances it was taken to fulfill a lower division requirement of the University.

Tables 1 and 2 summarize the relevant data. As shown by table 1, the ground work in general psychology has been laid for the majority of these three groups. Especially noteworthy is the number of students who have had eleven or more units of psychology, a number that closely approaches the required units in some of the basic medical sciences. Also of interest is the number of students who have 21 or more units in psychology; this number probably equals the number of units taken in any other premedical science. Some of them, being deeply impressed with the need of greater facility on the part of physicians of their acquaintance in handling personality problems, are looking forward to specialization in some aspect of medical psychology.

One cannot say positively that the data of table 1 are entirely representative of other groups of medical students who have completed a three or four year premedical program of study. But, if they closely approximate the true situation, as I believe they do, one may assume that to raise a question as to whether a formal course in psychology shall be given premedical students at the present time would be redundant, to say the least. Either the university requirements for

TABLE 1. Per Cents of Premedical and Medical Students Taking or Having Had Courses in Psychology

Course	Per cent of each group now taking or having had the course		
	Premedics N=92	Freshmen N=59	Sophomores N=46
Introductory	95	91	85
Abnormal or Mental Hygiene	71	40	54
Child or Adolescent	16	19	15
Social	11	6	9
Comparative (animal)	3	6	9
Industrial (business)	5	3	4
Educational	7	5	7
Psychometrics (tests and measurements)	3	3	15
Experimental (laboratory)	3	6	11

lower division students (years 1 and 2) or the students' choices have already settled this issue. What remains to be done, then, is to aid the departments providing these courses in selecting subject matter that is likely to be most serviceable to the students concerned, to supplement it where indicated, and in subsequent medical courses to build on this subject matter as is done with other premedical subject matter.

TABLE 2. Per Cents of Students Having Increasing Numbers of Units of Psychology (Number of Students the same as in Table 1)

Units	Premedics %	Freshmen %	Sophomores %
21 or more units	10.3	9.1	11.1
More than 15 units	17.5	19.7	20.1
More than 10 units	39.2	40.9	40.0
More than 5 units	83.5	56.1	56.6
4 to 5 units	13.4	36.4	20.4
No units	3.1	7.6	13.0

2. CONTENT OF THE GENERAL COURSE

The contents of courses in general psychology have undergone a remarkable change for the better during the past five or six years. While there is some variance from school to school, one may assume from the textbooks enjoying the greatest popularity that the courses constitute a general survey of the fields in psychology having the most stable content and the greatest usefulness to students. Preoccupation with the special sense organs, gross features of the C.N.S., the minutia of research, and highly theoretical and controversial matters are left to more advanced students specializing in the social sciences or in related fields of biology.

What I have just said in the abstract may be exemplified by reference to the main subdivisions and lecture topics of our general introductory course as given last year at Stanford.* They are presented in the left column of table 3. This is a five unit course that is completed in one quarter. There are four lectures and one discussion hour each week. Approximately, ten hours of outside preparation weekly is assumed by the instructor. As a general rule, one or more courses in biology have preceded this course in psychology.

TABLE 3.

LECTURES IN GENERAL PSYCHOLOGY	OUTLINE OF PERSONALITY STUDY (Adolf Meyer)
INTRODUCTORY	
1. What is Psychology? Prospectus.	
2. Types and Methods of Psychology.	
INTELLIGENCE AND PERSONALITY	
3. Tests and Measurements	
4. Individual Differences	
5. The Measurement of Intelligence	
6. Intelligence as a Personality Factor	
THE DEVELOPING PERSONALITY	
7. The Development of the Individual	
8. Heredity and Environment	
9. Motivation	
10. Feeling and Emotion	
11. Social Forces in Development	
12. The Dynamic Nature of Habit	
13. Constitutional Forces in Development	
PERSONALITY ADJUSTMENTS	
14. Conflict and Complex	
15. Thinking and Reasoning	
16. Various Modes of Meeting Conflicts	
17. Compensation	
18. Repression and the Unconscious	
19. The Psychoneuroses	
20. Theories of Personality	
THE LEARNING PROCESS	
21. Psycho-motor Learning	
22. Association and the Laws of Learning	
23. The Conditioned Response	
24. Memorizing	
25. Retention, Recall and Recognition	
26. Disorders of Memory	
27. Memory, Learning and Personality	
THE PSYCHO-PHYSIOLOGICAL BASES OF MENTAL LIFE	
28. The Nervous System	
29. Sensation and Perception	
30. The Sense of Sight	
THE PERSONALITY AT WORK	
31. Psychology and Medicine	
32. Psychology and Law	
33. Psychology in Business and Industry	
34. Psychology and Religion	
35. Psychology and Life	
SUMMARY	
36. Psychology and Human Personality	1. General personality survey (jobs, hobbies, activity with family, friends, religion, education and politics as examples of performance; type of rest and satisfaction obtained after effort).
	2. Special analysis of the psychobiologic assets (intelligence and memory functions, action tendencies, emotional rises and balance).
	3. Range and fluctuation of fitness with regard to work, play, rest, and sleep.
	4. Social relations in family, and the relative role of self-dependence and social dependence.
	5. Sex development.
	6. Synthesis and balance of personality (personality type, role of less directly accessible influences, the position of any "unconscious" determiners).
	7. Difficulties and handicaps.
	8. Specific disappointments and reactions to them.
	9. Assets and tendencies, favorable and unfavorable, traced to heredity, special sense organ development or motor abilities, etc.
	10. An enumeration of the events, experiences and situations in life which constitute special dynamic complexes or determining tendencies, in the form of an index of the significant results of the personality study.

The course is taught in a manner that is intended to impress on the student the integral character of all normal human reactions. Behaviorally and somatically speaking, man is treated as an integer from the time of the first fetal movement. Total reactions are discussed with a view to avoiding the older atomistic conceptions so frequently engendered by the psychology that was current prior to the last decade or two. In holding the students to this organismic viewpoint,

*Outline prepared by Dr. Robt. T. Ross, Assistant Professor of Psychology.

I venture to say, we are not less successful than other biologists presenting premedical subject matter. By placing the emphasis on total reactions we are contributing no inconsiderable bit to a laudable viewpoint that belatedly has been stressed in medical psychology.

3. Correlating the General Course in Psychology with a Proposed Course in Psychobiology

Time will not permit our noting in detail the numerous opportunities for tying in certain topics of general psychology with a course in psychobiology, such as that proposed by Adolf Meyer[6] for the first year of medicine. Nevertheless, a few glances at the two columns in table 3 will indicate some of the possibilities.

The elementary course does not appear to contribute specifically to the first topic listed by Meyer. This topic calls for a simple inventory of biographical data that appears to involve no major scientific premise. On closer scrutiny, however, one notes that these data on the self are likely to afford the basis for a comparison of oneself with other selves; i. e., to lead to a consideration of individual similarities and individual differences. Here our second group of lectures, as a whole, and lecture 4 in particular are relevant. Any student who has achieved even a preliminary understanding of the psychology of individual differences will have paved the way for accepting the psychiatrist's dictum that every human being must be individualized in study and treatment, because no two people are exactly alike. He also will readily understand the desirability of using norms and standards in describing and evaluating individual idiosyncrasies.

If Meyer's second topic is applied to the adult, there will be some benefit from references to and extension of the materials treated in lecture groups 2 and 5 in general psychology. If it is applied to children or adolescents, the topics of group 3 also will be relevant. In addition to providing certain factual data for which specific uses may be found, these three divisions will have acquainted premedical students with some of the common pitfalls to which one is subject when judging the assets of other people wholly in terms of what he knows about himself, or in satisfactorily plumbing his own assets without comparable data from other people of the general population. He may readily recall desirable precautionary information on the unreliability of simple hit and miss tests of retention, intellectual functioning, etc., for which representative standards of achievement are not available.

For the topics dealing with personality conflicts, some preparation has already been made by the lectures in general psychology. Illustrations accompanying these lectures are drawn, for the most part, from case records from nursery schools, public schools, college clinics and numerous other sources readily accessible today. These illustrations are discussed without undue emphasis on mental pathology, for each student's own experience permits him to take a sympathetic attitude toward the case under discussion. Identifications between case and student enable the premedical student to note the commonality of basic adjustment mechanisms in the well-adjusted and in the maladjusted, the mentally well and the mentally sick individuals.

Perhaps, one should not take the stand that general psychology may be of value in the premedical curriculum only because of its special reference to psychiatry. In a certain sense, a good course in general psychology is also a good course in biology, traditional nomenclature notwithstanding. They have many points in common that can be correlated to the great advantage of the student. What, for instance, is more illuminating to the premedical student than a proper collation of the lectures from general psychology on the developing personality with those aspects of structural ontogeny that lead up to the initial behavior of the embryo, and the elaboration of behavior in the growing fetus, neonate and child? Fortunately for the medical student, biologists are becoming more and more "behaviorally minded" now-a-days. By virtue of this, intentionally or unintentionally, they do a considerable amount of integrating of general psychology with their own subject matter in biology. This is a trend which the psychiatrists may do well to foster, for it lays a desirable foundation for many of their topics in psychobiology.

So far, only some of the more obvious opportunities for building a course in psychobiology on foundations outlined by the course in general elementary psychology have been indicated. One may readily surmise that these opportunities will be multiplied by a very large factor if a place can be made in the premedical curriculum for an additional 5 unit course embracing materials from comparative psychology, child psychology, personality maladjustments and mental hygiene. Such a course would not obviate the desirability of a subsequent course during the first or second medical years in psychobiology. It would, however, enable medical students to do more penetrating work in these topics and move more quickly to case work such as that with which they will be confronted in subsequent medical practice

4. Integrated Teaching Dependent on the Teaching Personnel

Effective integration presupposes a faculty that is disposed to cooperate to the fullest extent. Those who give the foundational courses in psychology must know what topics in psychobiology and clinical psychiatry are to be introduced in the subsequent years; likewise, teachers of psychobiology must be familiar with the content of courses taken by medical students in the preceding years. Effective measures should be provided to make students appreciate the essential continuity of the subject matter given in the premedical and the clinical years. Nothing is more disheartening than the necessity of sacrificing valuable time in lending unwilling ears to instructors who have no facility in recognizing the proper point of departure in a graded series of courses.

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The Personality Study as an Aid in the Teaching of Psychobiology*

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and
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The teaching of psychiatry to the undergraduate serves two closely correlated aims. In the first place, we wish to train the future practitioner in the prevention, recognition and treatment of frank personality disorders, not as a specialist, but within the limitations of general practice. As a part of this training, we wish to make him familiar with the manifold somatic manifestations of emotional disturbances, to teach him to distinguish between these and primary systematic or organ disease, and thus to prepare him for the large number of "functional," i.e., emotional cases which he will encounter in his daily work. Secondly, however, and of at least equal importance, is the necessity for impressing on the student his fundamental obligation as a physician to approach each patient as a person, an individual who is different from every other individual, a unique "total personality," and not merely a mechanical summation of anatomical structures and physiological functions. He must realize that every person, whether "normal" or "abnormal," will react to certain stimuli with certain responses, some typical, others individual; that, for example, no one's emotional life is unaffected by somatic disease; that the problem of resistance, treatment and convalescence are to a large extent dependent upon personality factors. No physician incapable of appreciating and evaluating such factors is fully equipped for the practice of medicine.

Just as in the field of somatic medicine the study of the anatomy and physiology of normal organs is indispensable to the understanding of these organs in disease, so in psychiatry the study of normal human personality structure and functioning is a prerequisite for the appreciation of "mental disease," which may best be defined as disordered personality functioning. The science which has for its object the investigation of the total personality of normal human beings is termed psychobiology; the special study of mechanisms which lead to disturbances of personality constitutes the field of psychopathology; clinical psychiatry deals with the classification, diagnosis and therapy of the various types of personality disorders, as well as with special problems in etiology and prevention.

PSYCHOBIOLOGY

Psychobiology, then, is defined as the study of the structure and functioning of human personality. Its ultimate aims and principles are the same as those of any natural science, i.e., to study in as much detail as possible the observable

*Read at the Forty-eighth Annual Meeting of the Association of American Medical Colleges held in San Francisco, Oct. 25-27, 1937.

facts, and to correlate them in such a way as to be able to formulate certain scientific laws governing the behavior of an experimental object in an experimental field; in other words, to satisfy the requirements of prediction and control, and to investigate the modifiability of the factors involved. Although a great deal of valuable work in this direction has already been done, much more remains to be done.

There are two major difficulties in the study of "man" as a biological unit. The first of these arises from the fact that of all biological species man is by far the most complex in his nature and culture; and the greater the complexity of a unit, the larger are the possibilities for variation. Actually, we know that no two people are entirely alike. The nearest approach to such "identity" of personality is to be found in some monozygotic twins who, in addition to identical heredity, have also been subjected to almost identical environmental influences; but even here close examination reveals marked and significant personality differences. Accordingly, there can be no simple laws of action and reaction which will be valid both quantitatively and qualitatively for all personalities. One of the tasks of psychobiology must, therefore, be the evaluation of structural and functional aspects of personality (1) common to all human beings; (2) common to large groups of human beings, and not to others (i.e., the problem of personality types); and (3) subject to marked variation in each individual.

Personality is determined by constitutional (hereditary) factors plus the sum total of all life experience. Two corollaries follow from this axiom: Personality is to some extent always in a state of flux, since environmental influences are always at work; and personality can never be understood entirely without a detailed knowledge of the life history of the individual. It is here that the second major difficulty in the scientific study of "man" arises. We stated above that the careful study of all observable facts was the cornerstone of psychobiology, as of all other natural sciences. We know, however, that many important facts in the life history of any individual are not accessible to direct observation either on the part of the examiner or of the individual himself. This is particularly true of ideas, feelings, and wishes which are related to early childhood experiences, to that time of life which is of primary importance in the formation of certain fundamental personality traits. Inasmuch as these experiences have long since been forgotten, and can only be elicted by means of highly specialized techniques, the obstacles in the way of a complete understanding of personality genesis are considerable. Nevertheless, a great deal can be learned about any individual by careful evaluation of his present behavior, his past performances, his thoughts, feelings, desires, interests and the like. The purpose of instruction in psychobiology is to teach the student how to go about assembling such facts, and how to coordinate them into a reasonably unified picture of a whole human being. Only when this is accomplished can the physician have a sound basis for the treatment of his patients, irrespective of the total personality or from more anatomically and physiologically determined diseases of the organs and systems.

Didactic instruction in the methods and results of psychobiological investi-

gation can be of value only if the student is encouraged from the start to apply this knowledge to the actual study of real personalities. For the beginner we feel that the method of choice is the careful, honest and objective study of himself. Adolf Meyer has compared the use of this type of study with the usual laboratory work in the basic sciences, in order to impress on the student the subordination of anatomical, physiological and biochemical aspects of man to the total living, functioning human being. Further advantages of such an autobiographical survey are as follows:

(1) Every investigation of one human being made by another human being involves an interplay of two personalities. In evaluating the personality of someone else, we tend to use our own personality, with its prejudices, special interests and habitual reaction patterns as a "measuring instrument." It is, therefore, apparent that a thorough knowledge of ourselves will help us to objectify our study of others.

(2) Every individual has at his disposal a mass of immediately accessible information concerning himself. To elicit a comparable number of facts about another person requires experience, special techniques and a great deal of time. Through a detailed study of his own personality, followed by a discussion of the results of this study with one of the faculty members, the student is enabled to demonstrate to his own satisfaction the validity of certain psychobiological laws, and the rôle of life experiences in the development of personality. He learns to recognize what facts in the present status and past history are most important and thus can exercise some degree of discrimination in eliciting information from others.

(3) The study made by the student is not only of value in the field of psychobiology, but will also serve in the ensuing preclinical and clinical years as a normal control for investigations in psychopathology and clinical psychiatry. In most individuals we find mechanisms at work which, if exaggerated, would lead to some type of personality disorder. A thorough discussion of these factors with the faculty advisor will go further than any amount of theoretical instruction in convincing the student of the fallacy of regarding "mental disease" as something strange and alien, foreign to all other human experience, and per se incapable of rational explanation. This attitude was, to a large extent, responsible for the therapeutic pessimism which not so many years ago pervaded the field of psychiatry. To be sure, there are many problems in both etiology and treatment which are in pressing need of solution, but this holds equally true of all other branches of medicine; therapeutic resignation is no more in place in one than in the other.

Objections

The objection most frequently made to the autobiographical personality study is that it is subjective in nature and, thus, unreliable. This criticism is justified to a certain extent, yet it appears to us to be largely beside the point. Obviously, much that is included in such a study is subjective, in exactly the same sense that information obtained from a patient about himself is subjective; but the

student is requested to give specific and concrete examples to illustrate his statements, and so objectify his opinions. In addition, the writing of the study is only part of the task; following this, the student is requested to discuss it in detail with his faculty adviser, one of whose functions it is to point out and attempt to explain discrepancies between subjective opinion and objective behavior. An understanding of the reasons for these discrepancies will, in turn, greatly broaden the student's knowledge of himself, and thus enhance the value of the study.

A more serious objection is that the whole procedure constitutes an unwarranted intrusion on the privacy of the individual. This cannot be dismissed lightly, since, in fact, the student is expected to be honest, not only with the instructor, but above all with himself. No compulsion is exercised, in that no one need fear poor grades for failure to comply with this standard; but without an honest and serious effort, the whole undertaking will be worthless. The student is given the assurance that what he writes and says will be entirely confidential, and that not more than one faculty member, and no one else, will see his study. Since the whole practice of medicine involves an intrusion in the privacy of the individual, it is not too much to expect the future practitioner to subject himself to that which he will later demand of his patients.

In the Colorado Psychopathic Hospital we are using a form for personality study developed by Franklin G. Ebaugh and John D. Benjamin. The study is divided into five main sections as follows:

1. Preliminary Survey: Before the student has received any didactic instruction in psychobiology he is requested to give a brief description of his own personality, to state what facts in his life seem to have been of major importance in giving special direction to his past performances and present behavior, and to discuss briefly any special difficulties of which he is aware.

2. The Historical Background: This section covers the family history, the general family setting, and a detailed investigation of as many important facts from early and later childhood as are available to the student.

3. The Analysis of Various Aspects of Personality: Under the subheadings of Intellectual Resources, Instinctual Drives, Affect and Mood, Somatic Factors, and Drives and Their Derivatives certain outstanding features of personality are investigated in detail, and the attempt made to correlate them with each other and to explain them at least partially on the basis of the material covered in the historical background.

4. The Total Personality in Action: The ambitions, satisfactions, ethical standards, interests, and social relationships of the student are investigated from the point of view of personality synthesis, i.e., the integration into a unit of the partial aspects of the personality covered in the previous sections.

5. Final Survey: Following completion of the study, the preliminary survey is rewritten in the light of such additional insight as the student may have acquired.

Our experiences to date with this method of introducing the student to the vast and complex field of personality are encouraging. We feel, however, that

the task would be lightened appreciably by adequate premedical instruction in the psychology of the total human being rather than in the psychology of sensations and organs. With full realization of the scientific value of and necessity for the exact quantitative studies of the academic psychologists, we cannot shut our eyes to the fact that these courses contribute pracically nothing to the preparation of the medical student for the actual psychobiological facts of clinical practice. The gap between academic and clinical psychology must be bridged more satisfactorily than heretofore if premedical work in psychology is to have the same relationship to psychiatry, let us say, that elementary organic chemistry has to biochemistry. On the other hand, there is equal, if not greater, danger in going to the other extreme, and instructing the premedical student in so-called abnormal psychology rather than in the fundamental principles of normal personality functioning. Without attempting at this time to suggest how this difficult problem can be solved, we would emphasize only two points: first, that closer cooperation between the psychiatrist and the psychologist is essential; and secondly, that the psychiatrists must assume a large share of responsibility for the present regretable lack of cooperation.

Discussion on Papers of Drs. George S. Johnson, Calvin P. Stone and Franklin G. Ebaugh and Maurice H. Rees

Dr. E. Stanley Ryerson (University of Toronto, Toronto, Ont.): Professor Stone has referred to the work of Professor Bott at the University of Toronto in relationship to the teaching of psychology and of psychiatry. We have had rather an interesting experience at the University of Toronto in this regard. About eighteen years ago the course was revised at the time it was changed to what we speak of in Toronto as the six-year course. In the development of that course, it was thought desirable to put elective subjects in the first three years of the medical course, and a group of electives in the arts subjects of the university were provided. Among these was a course in psychology. At the beginning, students elected psychology much the same as the other courses, and the division of the various electives was relatively equal. As each year passed by, the number of students electing psychology increased and, after six or seven years, about 75 per cent of the students were electing psychology as the elective to prepare them for the practice of medicine. It indicated a desire on the part of the student to obtain some knowledge of this aspect of the human being.

From that original development and as the result of this desire of so many students to take it as an elective, the faculty decided to make it compulsory in the medical course. That has continued since. Not only was it introduced at that stage, but a graded course throughout the whole curriculum was introduced. All students, after having taken this course in the freshman year, were given an opportunity in the sophomore year of the course to take an elective course in experimental psychology, carrying out the more objective tests and qualifying themselves from this standpoint. This course had to be limited owing to the facilities, and not more than thirty or forty students, or approximately one-quarter to one-third of the class could be accommodated. Each year that number has elected to take this experimental course in that year.

Following that, in the fourth year—what is our fourth year and which corresponds to your junior year—there was introduced the first lecture course in psychiatry, which

is compulsory for all students. Paralleled with this was a continuation of the elective course in which a student was introduced to what was spoken of as abnormal psychology, and a group of students each year who become interested in this aspect of medicine take this elective course in abnormal psychology.

Psychiatry is continued by a lecture and clinical course in the senior year, and we have an additional year in Toronto where, in addition to the lecture, the clinical aspect is given. In that way, a graded course from the first to the final year, over a period of five years, is continued throughout the undergraduate course.

It is interesting that in that development there has arisen not only a cooperation, an integration between the departments of psychiatry and psychology, but a very much more intimate coordination between the departments of medicine and of psychiatry, because in the department of medicine the staff includes certain clinicians who are also on the staff of the department of psychiatry and teach in the psychiatric hospital. Any cases in the general hospital that have any psychiatric problem are referred to these clinicians. They are consulted, whether in medicine, surgery or other departments, and the students are taught by these men, who are in both of these departments, primarily on the department of medicine and secondarily on the department of psychiatry. Vice versa, there are certain men in the department of psychiatry who are also called in by the department of medicine. So those two departments are very closely integrated in the instruction which is given to the undergraduate student.

A still further development has taken place in the past two years as a result of the initiative of the professor of psychiatry, who is also the head of the department as far as the Province is concerned and has a great deal to do with the mental hospitals throughout the Province. In order to raise the standards of the staffs and the men who are doing this work in the provincial institutions, there has been introduced a graduate course leading to a diploma in psychiatry. Two years ago, five members of the staff took this, and last year four members took this graduate course which is conducted not only by the department of psychiatry but all of the departments of the faculty of medicine, each taking a certain part in instructing these men in the mental institutions on the aspect of psychiatry in relationship to their particular field of medicine.

So, now, there is a graded course from the beginning to graduation, and a graduate course available in this field, which has come to be recognized as so important in the field of medical education.

DR. CALVIN P. STONE (Stanford University, San Francisco, Calif.): I am very happy to have Dr. Ryerson continue the discussion, particularly with respect to the problem of providing a graded series of courses utilizing psychology.

Medical instructors should look upon the introductory course of which I spoke as providing the premedical student no more than a general course in zoology provides for further training in biology. Psychology has a very broad content, like other fields of biology and the social sciences, and one can't expect everything that is needed from an introductory course. The latter should be supplemented.

While it is true, as was pointed out in the last paper, that some of the content of this introductory course is not relevant to the immediate teaching of psychiatry or any other aspect of medicine, it is also true that some of it has a forward look to the time when the individual completes the medical training and goes out to practice. We hope that the physician will be adequately oriented to read independently in psychology, to rub elbows with school teachers without feeling ashamed that he does not know the terminology they use, and to cooperate with other college graduates who have had considerably more work in the social sciences than he has had and who are continually amazed at his slowness in picking up ideas that have to do with personality disorders.

I wish now to reemphasize the fact that the ultimate objectives of medical psychology have never been clearly envisaged by the majority of the leaders in medical education.

There are such psychiatrists as Sadler who say that physicians are now turning away from their offices enough cases to make a good living for anyone who knew how to handle them. Adolf Meyer, in the paper from which I took that outline of psychobiology, says it is continually rumored that 40 per cent of a physician's calls involve some type of personality disorder that ought to be looked into before the patient leaves the individual physician.

The ultimate objectives have to be clarified somewhat before we can settle finally upon the immediate objectives for teaching, psychology or psychobiology to medical students. Psychologists would welcome the opportunity of reviewing the objectives with the medical teachers and the opportunity to assist in selecting subject matter in psychology particularly suited to the needs of medical students.

One word about terminology. The psychologists have no objection to the word "psychobiology." As a matter of fact, they like it very well. One finds that a great deal of what has been outlined under psychobiology is exactly the kind of material we have been teaching for several years to our students. It is true that we lack the favorable opportunity for applying it in concrete situations; the medical teacher is at a great advantage.

In talking to medical students who now are in their third and fourth years, I find the majority of them saying it is surprising that there is so little opportunity for them to meet the patients and deal with their mental problems. "What we get is just what we got back there in the elementary psychology course, more and more of the lectures, more and more of the case studies, and so on, but we cannot work with the maladjusted people." To work with one case is helpful, of course, but to work with seven, eight or ten cases would be more helpful.

Dr. Maurice H. Rees (University of Colorado, Denver, Colo.): I am interested in finding that other schools have had a happier experience with psychologists than we have had in Colorado. Our difficulty is to find a psychologist who can keep his feet on the ground.

Personally, I have never been able to see any reason for the term "abnormal psychology." It sems to me that when it becomes abnormal it enters the field of psychiatry, and the psychologist should let that field alone. I suppose the difficulty is to say just what is normal. It is a good deal like the old Quaker who said to his wife, "I think everybody is a little crazy, except me and thee, and sometimes I think thee is a little crazy."

Report of the Committee on Aptitude Tests for Medical Schools

F. A. Moss
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During the past year the work of the Committee on Aptitude Tests for Medical Schools has consisted of (1) a study to determine whether there is a medical aptitude independent of a general aptitude, or, to put it another way, whether there is a medical aptitude as contrasted with an aptitude for law, engineering, teaching and other vocations of a professional level; (2) the administering of Form 9 of the medical aptitude test to the 1937 applicants and the reporting of their ratings to the medical schools; and (3) a study of the value of the test in predicting the grades of the 1936-1937 freshman class.

Comparison of Performance on the Medical Aptitude Test of First Year Medical Students with Students in Other Professional Schools.—While recognizing that the medical aptitude test is of considerable help in selecting medical students and predicting their performance in medical school, several of the admission officers in the medical schools have raised the question as to whether the test is properly named, the feeling being that instead of measuring aptitude for the study of medicine it measured, primarily, general intelligence and that it should be regarded as a general intelligence test rather than as a specific aptitude test. With the hope of determining the extent to which it is a test of abstract intelligence and the part that specific aptitude played in it, the following study was devised.

It was decided to arrange for the test to be given in a number of outstanding professional schools representing students preparing for the professions of law, engineering, teaching and other vocations of a professional level. Only students in the outstanding institutions were to be tested. In this way it was thought that we could get the better class of students preparing for the various professions. It was reasoned that if in School A, for example, the medical students made an average of 150 points on the test and students in the other professional schools made substantially the same average, we could then conclude that the test was largely of a general intelligence nature; but if the medical students made outstandingly high scores on the test and the students in the various other professional schools made consistently low scores, we would naturally conclude that the test was not measuring general intelligence as such, for a number of studies have shown that the general intelligence level of the various professions is not very different. In the test of the draft army during the World War it was found that the engineering officers made the highest scores, followed by the medical officers, lawyers and the commercial groups; while in a study by Noble and Arps at Ohio State University, using the Army Alpha test, which is universally recognized as a test of general intelligence, the following median

scores were made by the various professional groups of students, and in a similar study at the University of Illinois by Yoakum and Yerkes the following median scores were reported:

TABLE 1. Standing in the Army Alpha Test in Different Schools Within a University

University	School or Department	Median Score
Ohio State University[1]	Arts, Commerce and Journalism	147
	Medicine	142
	Law	142
	Engineering	141
	Education	137
University of Illinois[2]	Graduate School	154
	Literature, Arts and Sciences	145
	Engineering	144
	Commerce	143

A glance at the above table will thus show that the general intelligence level of the professional groups does not show much difference, and if a test shows wide discrepancies between the intellectual levels of the different professional groups it would appear that it is not measuring general intelligence per se.

In order to carry out this study, we secured the cooperation of the law schools at the University of Pennsylvania, Western Reserve University and New York University; the School of Commerce at New York University; the Engineering Schools at New York University and Western Reserve University (Case School of Applied Science); the School of Education at New York University; and the entering students in the Postgraduate School of the U. S. Naval Academy. (These students graduated from the Naval Academy approximately six years ago and have spent the interim as naval officers). This list, while small, certainly represents a very high class group of schools.

To these groups was given Form 1 of the medical aptitude test. Form 1 was used because we had more data on it than on any of the later forms, also because it required less time to administer, and, further, because it had been given to freshman classes in medical schools.

Table 2 gives a comparison of students of these various other professional schools with medical students in terms of the percentile rank on the medical aptitude test of the lower quartile, the median and the upper quartile of each group. Chart 1 illustrates the variation in terms of raw score. The percentile rank, based on the 963 students who took Form 1 in the medical schools affords a means of translating raw scores into rank of 1 to 100. The 25th percentile, for example, represents a score on the aptitude test which ranks 25 per cent of the way to the top of the group, it is as high as, or higher than 25 per cent of the group and 75 per cent are above it. The 50th percentile is the middle score; the 75th percentile represents the score which is as high as, or higher

1. E. L. Noble and G. F. Arps: "University Students' Intelligence Ratings according to Army Alpha." *School and Society*, 11:233-37, 1920.

2. Yoakum and Yerkes: *Army Mental Tests*, p. 17. New York; Henry Holt & Co., 1920.

than, 75 per cent of the group, but poorer than the score of the remaining 25 per cent. Since the percentiles were based on the records of the 963 medical

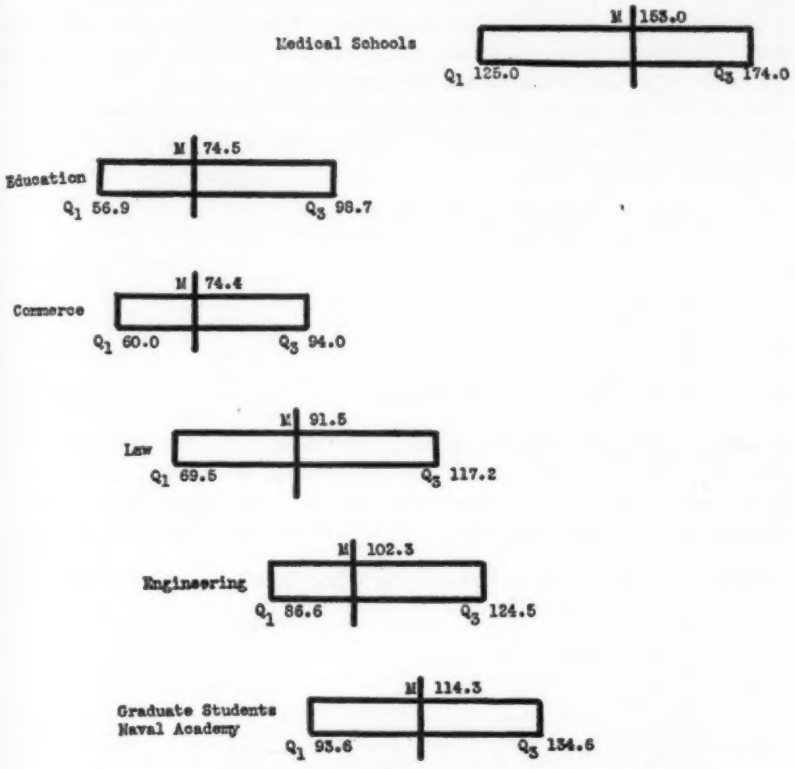

Fig. 1. Quartile Range and Median Score of Medical School Classes and other Professional Schools

schools included in this study, the lower quartile point, or Q_1, is the 25th percentile, the median is the 50th percentile, and Q_3 or the third quartile is the 75th percentile.

Table 2. Percentile Rank on the Medical Aptitude Test of the First, Second and Third Quartiles of Students in Various Professional Schools.

School	No. Cases	Percentile Rank of Q_1	Median	Q_3
Medicine	963	25	50	75
Other Professional Schools	731	3	9	20

A study of the figures in Table 2 makes it clear that students in the schools of education, commerce, law, engineering and naval officer students make distinctly lower scores on the medical aptitude test than medical students. The students in the schools of education and commerce are particularly low on the

test, 75 per cent of them making lower scores than the lowest 10 per cent of the medical students. Half of the students in law school were inferior in this test to the low 7 per cent of the medical students, and 75 per cent were inferior to the low 20 per cent of the medical students. The engineers, who ordinarily lead all groups in tests of abstract intelligence, are very little superior on this test to the education, commerce and law students, and vastly inferior to medical students. The best record of the non-medical groups is made by the naval student officers, but even this group, interested in and trained in science, falls far below the medical students.

TABLE 3. Percentages of Students in Various Professional Schools above the 50th and 75th percentiles on the Medical Aptitude Test

School	Percent above 50th Percentile	Percent above 75th Percentile
Medicine	50	25
Education	1	—
Commerce	1	—
Law	10	1
Engineering	10	2
Naval Academy (Graduate Students)	11	2

Table 3 shows the per cent of each group scoring above the 50th and 75th percentile. Not more than 11 per cent of any group do as well as the upper 50 per cent of the medical students, and less than 2 per cent of the other professional schools equalled the high 25 per cent of the students of medicine.

TABLE 4. Median Scores and First and Third Quartiles of Medical School Classes and Other Professional Schools

School	Q_1	Median	Q_3
Medical Schools	125.0	153.0	174.0
Education	56.9	74.5	98.7
Commerce	60.0	74.4	94.0
Law	69.5	91.5	117.2
Engineering	86.6	102.3	124.5
Naval Academy	93.6	114.3	134.6

The highest possible score on Form 1 of the Medical Aptitude Test is 250.

It will be noted that with the exception of the graduate group of the Naval Academy, the lower quarter of medical students made higher than the upper quarter of the nonmedical professional groups. This fact offers additional evidence that the test is not a direct measure of general intelligence for, if intelligence were the trait being measured, the results would be more nearly equal.

TABLE 5. Median Scores and First and Third Quartiles of Law and Medical School Students Taking Form 1 of the Medical Aptitude Test

School	No. Cases	Q_1	Median	Q_3
Law	74	73.8	93.1	116.5
Medicine	62	174.2	193.7	199.5

This is further illustrated by a comparison of students in the law and medical schools of the same university, one of the outstanding institutions in this country. The law students make decidedly inferior scores on the test.

This is the only institution in which students in two professional departments of the university took the same form of the aptitude test the same year. But it is possible to make a comparison in terms of percentile rank of law and medi-

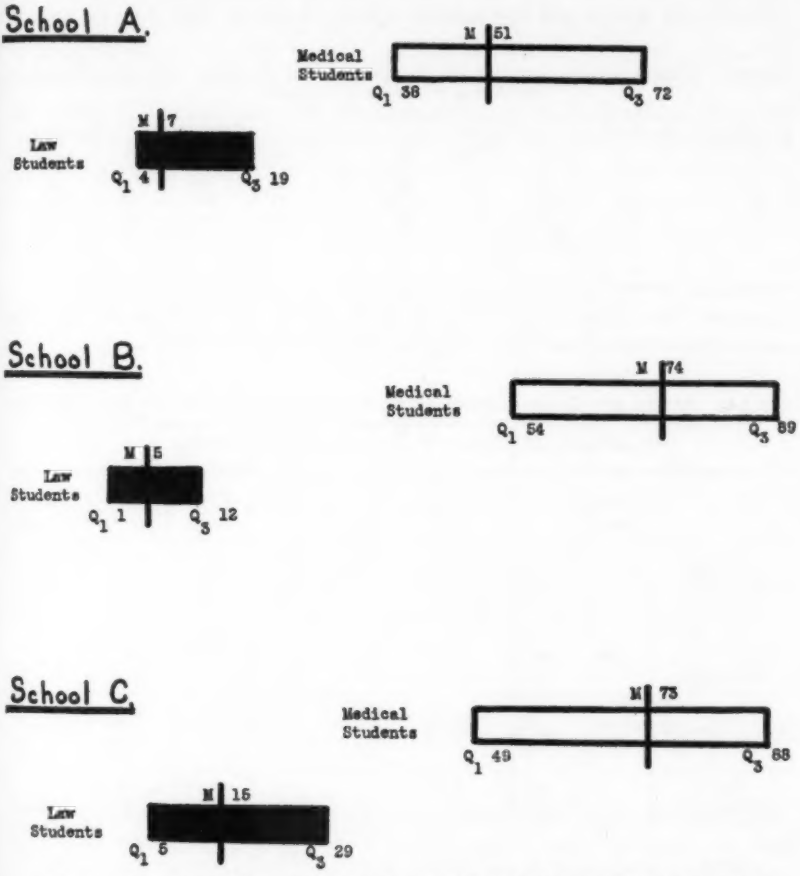

Fig. 2. Comparison of Percentiles of the Median and First and Third Quartiles of Classes in Law and Medicine in Three Universities

cal classes in three universities, although in this case the law students took Form 1 of the aptitude test and the medical students Form 8. Again, the medical students make a markedly better showing.

Table 7, showing the median scores and interquartile range on the separate parts of the medical aptitude test, indicates points of strength and weakness in the different groups tested. Test 1, a test of scientific vocabulary, and Test 2, an information test based primarily on premedical courses, would seem logically to favor particularly those groups with scientific training. This assumption is

borne out by fact, as the naval officers and engineering students make a higher median score than any others, except the medical group, which is highest of all. It is interesting to note that in the vocabulary test the third quartile of the law students is higher than that of any group except the naval and medical groups, although the median and low quartile points are not so high. On the test of

TABLE 6. Comparison of Percentiles of the Median, and the First and Third Quartiles of Classes in Law and Medicine

School	No. Cases	LAW Q_1	LAW Median	LAW Q_3	MEDICINE Q_1	MEDICINE Median	MEDICINE Q_3	No. Cases
A	74	4	7	19	38	51	72	67
B	65	1	5	12	54	74	89	121
C	21	5	15	29	49	73	88	112

premedical information, the engineering group is superior to all groups except medicine. Here, identity of subject matter in courses such as chemistry, physics and mathematics in these departments is evident in the test results.

TABLE 7. Median and Quartile Points on the Separate Parts of the Medical Aptitude Test made by Students in Various Professional Departments of the University and graduate students at the U. S. Naval Academy.

	Total Score		Medicine	Education	Law	Commerce	Engineering	Naval Academy
Test 1 Scientific Vocabulary	40	Q_1	31.4	17.8	28.0	17.3	26.3	29.4
		median	25.7	12.4	19.5	11.9	21.1	24.0
		Q_3	19.0	7.3	12.3	7.0	16.2	20.2
Test 2 Pre-Medical Information	100	Q_1	59.5	27.1	31.9	23.9	40.9	40.6
		median	48.7	18.9	22.3	15.0	34.5	32.8
		Q_3	37.0	10.5	12.6	7.1	27.7	24.0
Test 3 Visual Memory	20	Q_1	20.0	16.9	12.6	12.0	16.4	13.3
		median	19.2	12.4	8.2	7.6	11.5	10.1
		Q_3	17.1	7.3	5.2	4.7	7.6	5.6
Test 4 Memory for Content	20	Q_1	20.0	7.7	9.0	8.4	8.4	10.3
		median	18.3	4.4	5.0	4.6	4.0	6.6
		Q_3	14.8	0.0	0.0	2.3	0.7	3.1
Test 5 Comprehension and Retention	40	Q_1	36.0	29.9	32.5	29.3	29.6	33.0
		median	28.5	23.0	26.0	21.0	23.0	28.4
		Q_3	20.2	15.2	20.7	13.6	16.9	21.2
Test 6 Understanding of Printed Material	30	Q_1	26.9	14.8	22.0	22.8	24.3	24.8
		median	20.1	9.5	14.7	18.3	18.9	18.7
		Q_3	12.5	3.0	8.2	11.7	13.8	12.8

Tests 3, 4 and 5 consist of questions on a diagram and on several reading passages studied before beginning the test itself. It is probable that none of the group were previously familiar with this material, hence all should have approximately an equal chance so far as background is concerned. Interest, aptitude, speed of learning and accuracy of retention enter to cause the difference in results.

How the Medical Aptitude Test Predicts Grades in Other Professional Schools.—Late in our study we thought that it would be well to check the correlation between grades in the different professional schools and the scores on the Medical Aptitude Test. We have not yet been able to get the grades from all of the professional schools, but we have secured them from several of the schools. These correlations begin at .11 between the grades of the engineering students and test scores and extend to the average correlation of .47 for the law schools. The correlation for the commerce students is .28 and for the naval officers it is .29. We were unable before the time of this report to get the grades on the education group.

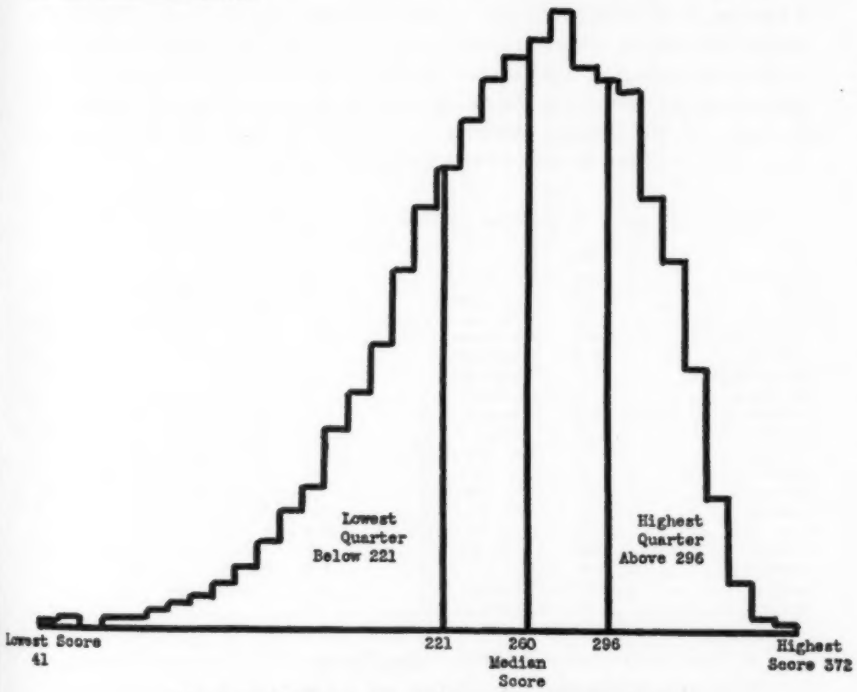

Fig. 3. Total Distribution of All Total Scores (Form 9)

In the same university we had the grades on Form 1 for the law and medical students. The correlation between the aptitude test and medical grades was .60, whereas the law students gave a correlation of only .33.

The group on whom we had the largest number of grades was the postgraduate group of the Naval Academy, and on this group we secured the relative standing of the students in their own class for four years' work in the Academy. This gave a correlation of .29. These correlations, while showing a slight predictive value of success in the different professional schools and thus indicating an element of general intelligence in the test, still are too low to be of

very much significance. If, for example, we had found that the test scores gave a correlation of .60 or above with grades in the non-medical groups we could well have concluded that it was measuring some general trait rather than a particular aptitude for the medical school, but this was not the case.

In summary, from the available data we are apparently justified in concluding, first, that the test is not a general intelligence test, and, second, that it does measure some of the traits most necessary for success in medical school. It must be borne in mind, however, that the background and preparation of the non-medical professional group of students was radically different from that of the medical group, and that the test was designed specifically for premedical students. This fact, in all probability, had considerable effect on the scores. While the number of cases on which these conclusions were based are recognized as being smaller than desirable, still the data are too consistent for us to expect that the addition of four or five times the number of cases would greatly affect our findings. We are planning, however, to continue the study and hope to get a much larger number of cases for our subsequent studies.

TABLE 8. Distribution of Number Taking Test by States

State	Number	State	Number	State	Number
Alabama	181	Maryland	184	Pennsylvania	1048
Arizona	19	Massachusetts	469	Rhode Island	61
Arkansas	53	Michigan	392	South Carolina	134
California	676	Minnesota	246	South Dakota	37
Colorado	110	Mississippi	126	Tennessee	267
Connecticut	124	Missouri	252	Texas	481
Delaware	9	Montana	24	Utah	72
District of Columbia	188	Nebraska	195	Vermont	58
Florida	70	Nevada	5	Virginia	296
Georgia	174	New Hampshire	77	Washington	122
Idaho	28	New Jersey	96	West Virginia	157
Illinois	423	New Mexico	10	Wisconsin	186
Indiana	263	New York	1318	Wyoming	15
Iowa	186	North Carolina	273	Canada	157
Kansas	211	North Dakota	22	Puerto Rico	32
Kentucky	178	Ohio	574	Hawaii	12
Louisiana	234	Oklahoma	184	Canal Zone	3
Maine	55	Oregon	86		

The Test of December 4, 1936.—On December 4, 1936, our Committee, for the seventh consecutive year, carried out a program of administering the new form of the medical aptitude test (Form 9) to students in the arts colleges who expected to apply for entrance to a medical school in the fall of 1937. The new form, which had been constructed during the preceding summer, consisted of the following separate tests: (1) General Information; (2) Vocabulary; (3) Spelling; (4) Logical Reasoning, and (5) Understanding of Printed Material.

Using this form, 10,853 tests were administered in 627 arts colleges during the fiscal year 1936-1937; 48 from September 1 to December 3, 1936; 10,400 between December 4, 1936, and January 25, 1937; and 405 since January 25, 1937.

The total scores made on Form 9 ranged from 41 to 372 out of a possible 380 points. The median total score was 260, one-half of those taking the test

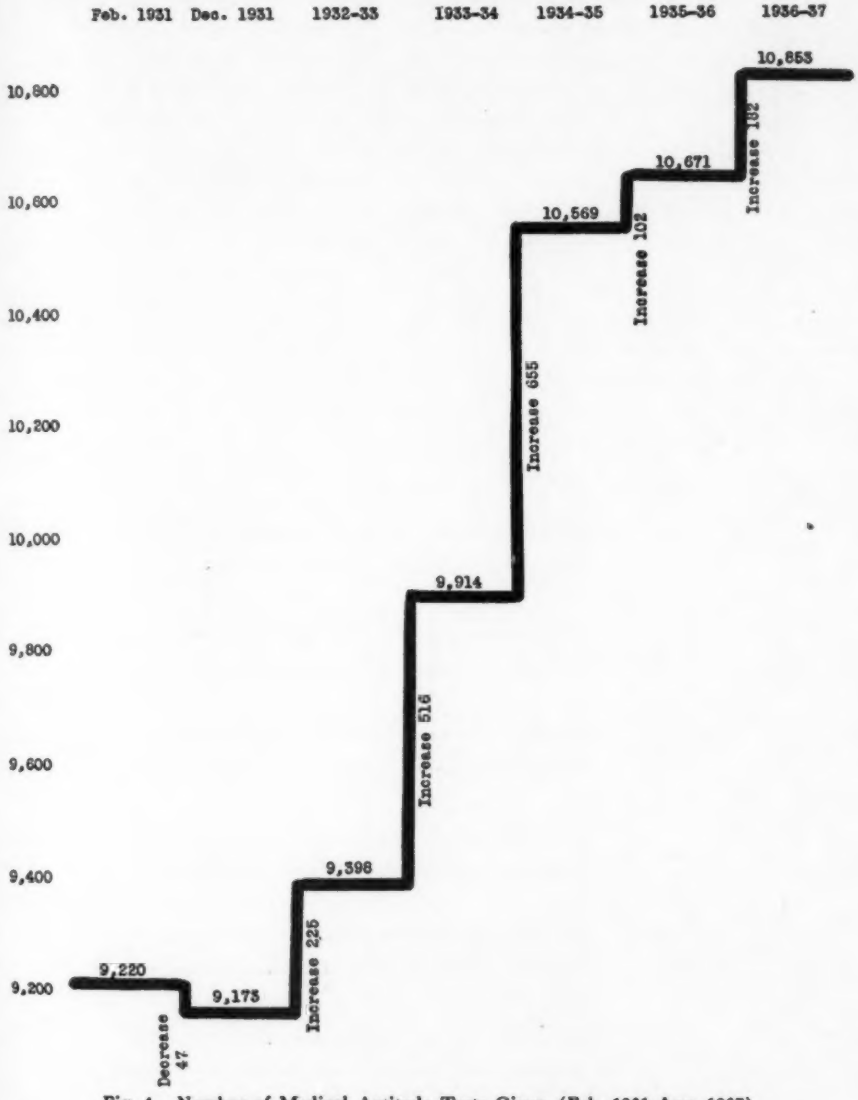

Fig. 4. Number of Medical Aptitude Tests Given (Feb. 1931-Aug. 1937)

falling above this score and one-half below. On total score, the highest quarter made above 296; the lowest quarter below 221. The distribution of all the total scores is shown in Chart 3.

A report of the test ratings of the students tested on December 4, 1936, was forwarded to the admission officers of the medical schools on January 25, 1937. Since that date, three supplementary reports have been sent out covering special tests given during the year.

Increase in the Number of Students Taking the Test.—During 1936-1937 182 more tests were given than during the preceding year, and nearly 1,700 more

TABLE 9. Summary of Number of Tests Given

Form	Date	Number of Tests	Number of Schools
Form 1	1928-9	1,552	In medical schools
Form 2	1929-30	5,916	In medical schools
Form 3	Feb. 1931	9,220	547 premedical schools
Form 4	Dec. 1931	9,173	537 " "
Form 5	Dec. 1932	9,398	546 " "
Form 6	Dec. 1933	9,976	636 " "
Form 7	Dec. 1934	10,569	615 " "
Form 8	Dec. 1935	10,671	624 " "
Form 9	Dec. 1936	10,853	627 " "

than in 1931, the first year the tests were given in the arts colleges. The steady increase in the number of tests given is shown in Chart 4 and Table 9.

With the continued increase in the number of tests given each year, the number of students admitted to medical school without taking the test has

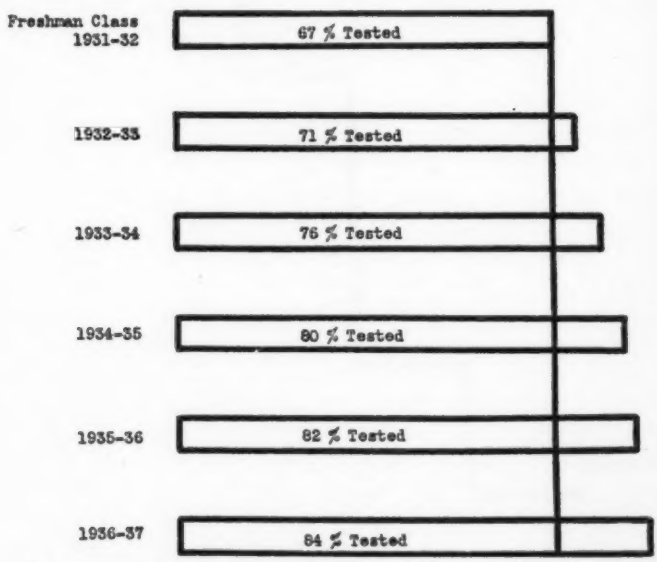

Fig. 5. Percentage of Freshman Classes Having Aptiude Test Scores

steadily decreased. It will be noted from Chart 5 that more than 80 per cent of the last three freshman classes have been tested, 84 per cent of the 1936-1937 freshman class having test scores.

Percentile Ranking of Students Admitted to Medical School (Fall 1935) Compared with the Entire Group of Applicants Tested.—A comparison of the test ratings of the students admitted to the 1936-1937 freshman classes with the entire group of applicants who took Form 8 in December, 1935, indicates clearly that students who make high scores on the test are admitted to medical school in decidedly larger numbers than those making low scores.

TABLE 10. Comparison of Aptitude Test Scores of Students Admitted (Fall 1936) with Those of Total Group of Applicants Tested

	All Applicants	Students Admitted
Highest 10 per cent made score above	286	292
Highest quarter made score above	256	264
Median Score was	219	228
Lowest quarter made score below	179	192
Lowest 10 per cent made score below	144	159

Prediction of Medical School Grades (Freshmen, 1936-1937) by Aptitude Test Scores.—Chart 6 shows that the test predicted success in the first year of medical school with considerable accuracy. The students in the freshmen class having test scores were divided into ten equal groups (deciles) on the basis of their standing on the test. Each bar in Chart 6 shows the percentage of failures in the group, and the average grade of students in that decile. The average grade declines evenly from the highest tenth to the lowest tenth, while the percentage of failures steadily increases.

It is interesting to note that there is a decrease in the number of failures which is probably to be attributed to a better initial selection of students. In this connection we should also note that a larger percentage of students entering medical school last year had been tested than at any time in the past.

Administrative Difficulties and Proposed Changes.—Our experience over a number of years has indicated certain defects in the set-up for administering the test. With the test given by more than 600 examiners in the various arts colleges, it is almost impossible to get all of them to follow absolutely standard procedure for administering it. This is especially true since many of the examiners do not realize the extreme importance of following to the letter the procedure laid out in our instructions and of keeping the time to the minute. In some instances, the examiners have allowed more time than they should, and in other instances they have not exercised the proper amount of vigilance to prevent cheating. In most cases this is due to the examiner's failure to appreciate the absolute necessity of following the standard procedure, but in some instances it is apparently due to the desire on the part of the examiner to make his school show up as well as possible on the test, and in a few instances it has been due to the fact that the examiner did not have a sufficient number of proctors to assist him in the administration of the test.

Ideally, it would be best to have all of the students go to twenty-five or thirty centers for the administration of the test. There we could have paid and

specially trained examiners in charge. We are probably not yet ready to make such a radical change in our administrative procedure, but it seems certain that such a change would greatly improve the predictive value of the test results.

Supplementary Tests.—Each year there have been several hundred students who for one reason or another have failed to take the test at the regular time in December and have subsequently applied to medical school and have been requested by the admission officers to take a special test. The results of these exam-

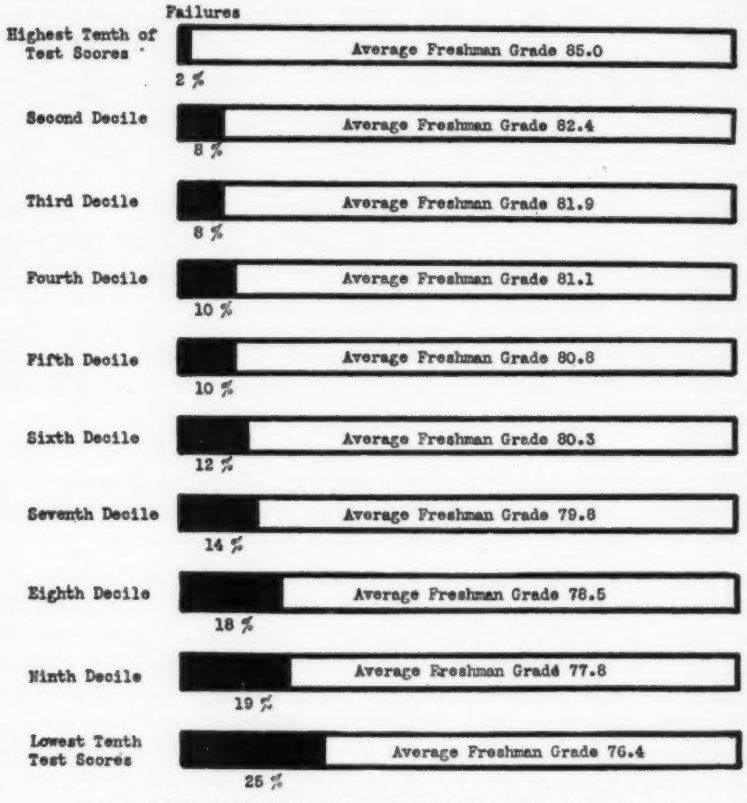

Fig. 6. Medical School Performance at Various Test Score Levels Freshmen, 1936-1937

inations are not as reliable as are the results of tests taken at the regular time, apparently because of two things. In the first place, it is necessary to give these students a form of the test which has already been given in some previous year, and there is always the likelihood that the student, from talking with those who have had the test in the past, may receive some information about the test which would give him an undue advantage in taking the make-up examination. The reason for giving an old form of the test is that if we made an entirely new test

for a few students we would have no norms on which to interpret the results. A second cause of the unreliability of these results is the fact that in most instances the examiner has only one or two students taking the test and consequently does not have the incentive for extreme care in following the same standard administrative procedure.

Our Committee has now devised a plan which it is hoped will take care satisfactorily of the whole problem of supplementary examinations. It is proposed to charge $5 instead of $1 for each supplementary test. This will tend to discourage the failure to take the examination at the regular time. It is proposed, further, that the supplementary tests be given in ten centers only once a year, probably in late March or early April. By giving the supplementary test only once we can pay the proctors of these tests for their time in administering them, and we can afford to devise an entirely new test for this supplementary examination. It is believed that with the changes recommended above the problem of the supplementary examinations will largely be solved.

The Study of Medicine at Cornell University Medical College and the New York Hospital

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In accordance with well established tradition, some member of the staff addresses the school at the beginning of the academic year. He welcomes students of the first year who are beginning the study of medicine. Furthermore, he may use the occasion to say what he thinks may be helpful to those already in the school; and to the students of the fourth year, who are even now preparing to leave, he may attempt to say something to aid them in choosing the direction of their professional work. He is likely to offer advice by which some pitfalls in the difficult paths before them may be avoided. I shall try not to give advice. It is unlikely that I would offer it in the impressive form in which it is already available to you.

Read some of Osler's essays on the study of medicine. He will tell you that you must put into the study of medicine all the intelligence and all the energy you possess. The master word is WORK. There will be no time, he says, to sit in the shade with Amaryllis or to play with the tangles in Neaera's hair. Most of you will require no encouragement to pursue with enthusiasm the task before you, for with a fair knowledge of biology you have deliberately chosen medicine as a profession.

I may say, tritely, that those who need advice most are least likely to take it. In regard to advice, you will doubtless find soon enough that it is more blessed to give than to receive, and it will be welcomed from the few of you who will, perhaps, as in the past, give it generously to the faculty. I shall choose the easier task and describe some of the peculiar characters of the professional study of medicine.

Students entering the school are assured that they are a highly selected group. Hundreds, perhaps, apply, and scores are chosen. The selection is presumably based on scholarship and those characters of personality that are recognizable in any group of people brought in college into more or less intimate contact with one another. In practice, all human selection is subject to error. The good doctor requires traits of character and human sympathy that cannot be recorded on a blank form or recognized during a hasty interview, but without them, the physician is incompetent to assume those responsibilities that the practice of medicine imposes. You must have these characters in the form that places the welfare of a patient before all other considerations; if you do not have them, you must do the best you can to acquire them.

Medicine, we have long been told, is a learned profession, but the statement is more accurate today than formerly. The apparent contrast between theory

and practice is deceptive and is doubtless based on failure to grasp the relation of one to the other. There can be no contradiction between medical science and medical practice. To most of you this will seem obvious. Not long ago I heard a physician, defending in discussion before a medical society a somewhat doubtful statement he had made, say: "I speak clinically, not scientifically." I think that the statement was made carelessly, but in five words it denies the whole foundation of modern medical practice. Students of medicine must have the scholarship essential to grasp the foundations of biology, including psychology, the relation of chemistry and physics to living things, and the intricacies of microbiology and immunity. This statement emphasizes rather than weakens the truth that the primary aim of the medical school is to make good doctors.

Students entering the medical school pass from the college, which is an undergraduate school, to a professional school which by long accepted usage is a school of the university. The transition is abrupt and the change to some of you may seem very drastic. Many students at the beginning of the first year feel keenly the loss of a guidance of which in the college they have been, perhaps, scarcely conscious. The medical students have suddenly thrust on them a considerable degree of independence and the use they make of it will in many instances determine the character of their medical career. The professional school is not inclined to ask when students come and go. It maps out the course with a rigidity that is, perhaps, somewhat unfortunate, and not in accord with the traditions of European universities, but it leaves to the student's initiative how it shall be pursued. It is no longer considered desirable, as in the college, to determine by quizzes and examinations, repeated at frequent intervals, if one part of a subject has been mastered before another is begun. Grades and credits no longer have the significance assigned to them in the high school and in the college. The student of medicine has entered on his professional career and must in increasing degree from now on learn to exercise his own judgment and become his own guide. Many students very naturally leave the atmosphere of the college with a good deal of regret and cling to collegiate customs and activities. I suspect that there is a good psychological basis for abandoning them in the medical school.

Medicine being a learned profession, some knowledge of English and of one other modern language is required for admission to the school. The extent of this knowledge is referred back to the college and is designated in the catalogue of the medical school as six semester hours. Exactly what this means is not readily determined. Does it means that all those who enter the school can write English that would be regarded as creditable if it were printed? This is a fair test of readable English. Does it means that the student can read a textbook or journal in the language for which credit has been obtained? Fortunately for the student before admission, and unfortunately afterward, the required semester hours cannot be given these interpretations.

During the course in medicine and throughout a professional career it will be essential to observe and describe with accuracy the character of changes that

are in progress during the course of disease and to make detailed and intelligible written reports upon them. This is not investigation but a prerequisite to the preparation of clinical records, without which no effective medical practice is possible. A student or physician does great injustice to the knowledge he possesses if he is not able to write with ease a readable account of his observations. Examinations in the school and before state boards and other licensing examinations have this advantage, at least: they bring to mind with urgent insistence the need of expressing one's ideas in understandable language and readable script. A well known internist, George Dock, has written a paper on spelling as an index of the preparation of the medical student. He has had in mind not the finer points but grosser irregularities and has discussed the subject as he might have described a chronic disease. Accurate thinking about the medical sciences and accurate observation of clinical cases will be done with an immense handicap unless the physician is capable of expressing himself with ease in one language. He will be greatly benefited if he can read with facility two more, let us say, German and French.

For some, it is difficult, at first, to grasp the truth that there is lacking a defineable body of fact that constitutes the essentials of medical science, and some, indeed, do not really understand that a necessary feature of medical, as well as other science, is change and development. In a lecture last year, I discussed the nature of tumors and described at some length various opinions concerning their causation. A member of the class said to me after the lecture, "You have described to us a good many theories of tumor growth but you have not said which you believe." I told him that the evidence in favor of no one of them was as yet sufficient. We must encourage the conviction that present knowledge is insufficient and subject to revision. This state of mind brings discomfort to some. So far as the course in medicine is concerned, it will have been in considerable part successful if it has developed in you the capacity to acquire and use the new knowledge that the future will bring. One of our major aims is to avoid the possibility of mental stasis.

It is often said that medicine is an art as well as a science. Much of the laboratory work in the fundamental sciences is concerned with experimental methods and the use of instruments of precision. The ability to use instruments adapted to the recognition and control of disease is one of the most essential factors in the training of a doctor. We may well question if those who are training themselves to become doctors are sufficiently conscious of the need of manual dexterity. Should we not do more to perfect ourselves in the use of instruments essential to the diagnosis of disease? The fluoroscope is used in the department of anatomy to aid in learning the anatomy of the living body. There is an x-ray anatomy and pathology as well as that which is recognized by the eye and by touch. Ability to use such instruments as the ophthalmoscope, laryngoscope, etc., might well be acquired early. Skill in handling wounded tissue is necessary to the physician as well as to the surgeon.

I realize that the medical course is already overcrowded and one of the

first suggestions of a group of physicians or welfare workers employed in a new field is that a course dealing with the subject in which they are interested be introduced into the medical curriculum. This tendency, if judiciously resisted, is in general beneficial, and recently courses in such important subjects as psychobiology, applied pharmacology and dietetics have been introduced. Courses in oral surgery have long been under discussion. The last proposal I know of is a course in eugenics. This effort to meet existing demands is highly desirable, but may readily overfill all the time there is. It also emphasizes the importance of widening the field of elective courses.

I wish to say, again, that the foremost purpose of the school is to make good doctors. To do this, it is obviously essential that both students and staff have personal contact with the methods and considerable familiarity with the literature of the medical sciences. It is a matter of experience that some students of the medical school, in accord with the best traditions of the graduate schools of a university, find that they are drawn by the interests they develop to undertake investigation in some one of the medical sciences. The number of students who undertake research during the medical course is considerable but proportionately small—as it should be. It is often said that medical students are overworked, but it is encouraging to find that some of them can bring to completion a creditable research and at the same time fulfil without undue exertion the requirements of the school. Such research from the standpoint of the school and of the student is wholly elective but when successful is evidence of unusual accomplishment and influences profoundly the careers of those who undertake it.

The transition from the fundamental sciences to clinical subjects of the third and fourth years of the course is made very gradually during the second year so that in the third and fourth years you are chiefly concerned with the applied sciences of medicine. Pathology is the bridge between the fundamental sciences of morphology, chemistry, physiology and microbiology, on the one hand, and the various aspects of medicine and surgery. It is concerned with function, represented by the biology, chemistry and physiology of disease, as well as with structure. I have no inclination to belittle structure in order to magnify the importance of function; they are essentially different aspects of the same idea and inseparable. Pathology correlates etiology, represented by bacteriology and other phases of microbiology, with the reactions of the invaded body and thus constitutes the study of pathogenesis, obviously essential to an understanding of the nature and progress of disease. Last year a short course was introduced into the second year with the purpose of emphasizing the correlation between the fundamental sciences and clinical medicine. The course proceeds parallel with that in pathology. As various subjects that lend themselves to this form of demonstration are introduced, the manifestations of functional and anatomical change that can be seen in the living patient are correlated with those demonstrable by observations after death and by experimental investigation. The chief aim of the course is to emphasize those aspects of physiology and pathology that are recognizable in patients and to develop a conscious recognition of the relation of these fundamental sciences to the art of medicine.

The relation of pathology to the diagnosis of disease is emphasized by another exercise in which those associated with the hospital as students, interns, residents and visiting staffs of all departments, including pathology, meet on a basis of common interest. This is the Clinical-Pathological Conference. Here, certainly the distinction, which has no real existence, between students and staff is forgotten, as it should be. The clinical history of those who die is reviewed in the light of what has been found at autopsy, with special reference to diagnosis and treatment. Cases are reviewed and discussed with few inhibitions and no reservations and the frankness of the discussion of errors, is often astonishing. As these conferences are usually conducted, the senior members of the staff are quizzed and they express themselves freely although the autopsy is at hand to determine if they are right or wrong. Many eminent practitioners of this city give almost a whole afternoon to these conferences week after week. I often wonder how these physicians in busy practice can afford to attend them, and how any student or member of the intern staff can afford to miss them.

The recently established association of a health center district of the city with the department of preventive medicine of this school is analogous to the relation that exists between the school itself and the hospitals with which it is affiliated, because preventive medicine, like curative medicine, is applied science and requires for its practice a field service or clinic. The Kips Bay-Lenox Hill District, in which the medical school and hospital are situated, represents one of the subdivisions of the City Health Department and will provide opportunity for practical work in preventive medicine. It will be organized for public health administration in such intimate association with our department of preventive medicine that the students of this school and the nurses of the training school will be able to take part in the practice of preventive medicine as it is applied to the maintenance of health in this city district. The health center building, situated within half a block from the medical school, will be occupied jointly by the department of preventive medicine and the municipal health administration.

It is now essential that preventive medicine and public health become a significant part of the training of doctors. In increasing measure the internist, including the obstetrician, the pediatrician and the psychiatrist—surgeons are primarily internists—will be concerned with the prevention of disease and its recognition before it has impaired health. Today no questions concerning the medical profession are more pressing than those that may be designated "social medicine," that is, the relation of the profession to the community. They have to do with the care of the indigent sick, the cost of medical care, the part of government in the control of disease, and more specifically, what part should be assigned to public health officers in the control of such diseases as tuberculosis, syphilis and gonorrhoea, prenatal disease, maternal mortality, etc. What is the function and field of the public health nurse? These and similar questions are today the chief concern of organized medicine. Whatever may be the answers to them, it is very evident that the prevention of disease will be dominant in the solution of social and governmental problems. The physician of the future

will be more and more involved in the practice of preventive medicine and it is essential that he gain first hand knowledge of the subject as a medical student. Furthermore, an increasing number of medical graduates will inevitably be drawn by their own interest in the subject, which combines scientific medicine and social welfare, into a career in public health.

In the early part of the fourth year, students of the school must make some momentous decisions. They must determine then what they will do the following year, in what hospital they will try to get internships, whether these will be in medicine, in surgery, or so-called rotating internships. I shall express my own conviction that those are especially fortunate who succeed in obtaining internships in the environment in which they have pursued their medical studies, that is, in New York Hospital. They have here the opportunity to get an introduction to practice in close association with those whose methods and personality they know. The school offers wide opportunity to those who are prepared to profit by it and, in turn, it is advantageous to the school and hospital to associate with it its own graduates. I am not unmindful of the broadening experience of work in more than one institution, but I would prefer to obtain this varied experience after the internship, if possible. It is especially fortunate that the school and hospital, through its assistant residencies and residencies, offers the opportunity to pursue prolonged periods of practice and study in internal medicine, surgery, obstetrics, pediatrics and psychiatry. In relation to specialization, a famous physician of New York, Dr. Jacobi, has given this advice: "I advise you to go into general practice first and build up a specialty in later years on the strength of your general knowledge and attainments. Those who expect to obtain reputation and riches out of premature limitation will not attain success."

For the few of you who wish to pursue a career in one of the fundamental sciences of medicine, there is ample opportunity here and elsewhere. For some of you who plan a career of wide horizon in medicine or surgery it may be profitable to devote a year or more at some later period to one of the fundamental medical sciences. Those of you are most fortunate whose interest already has been caught by some phase of medicine, whether in clinical medicine or in the fundamental sciences, and can map out for yourselves a course that will conform to the career you plan. These are the ones who have "caught fire," as it has been said. On the contrary, to change the metaphor, "No wind is favorable to him who does not know to what port he is sailing."

The students of this school and this hospital have come into an inheritance of which they should be fully aware. It is now five years since the New York Hospital and Cornell University Medical College have come to occupy the same home. This is a wedding anniversary, so to speak, and is, perhaps, an appropriate time to recall the high aim that brought the two institutions together—I quote from the agreement between them: " . . . better and more important service to the sick of the community, and to medical education and medical science."

Study of Applicants For Admission to the 1937 Freshman Class of Seventy-eight Medical Colleges in the United States

TENTH STUDY

FRED C. ZAPFFE

Secretary, Association of American Medical Colleges
Chicago, Illinois

When the study of applicants was originally planned, the motivating thought was that the results accruing from such a study would furnish the answers to many questions asked for a long time and to which an answer had not been forthcoming. Up to that time, no one could say how many persons made application for admission to a medical college; whether one or more applications were made; what action was taken by the colleges; how many of the applicants were accepted; to what extent did previous education determine acceptance; when an application was rejected—on what was rejection based? These, and many other questions have been answered definitely by the study of applicants. True, the information gleaned from the study has been somewhat repetitious over the period of years, but definite information has resulted—not obtainable elsewhere—and, if one will take the time to review the findings in the light of his own experience as a medical administrator, president or dean, or a medical teacher, they can be put to good use, probably with a notable improvement in the educational and scholastic standing of accepted applicants.

The results of this study of applicants can be appreciated better and be made to serve a useful purpose if and when they are compared with the study of student accomplishment made by the Association of American Medical Colleges since 1928. These results are published annually in the JOURNAL OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES. There is a definite correlation between these two studies and they give a good and correct account of the discrepancies existing between certain published data in which figures vary. The reason for this variation is made clear. Then, too, both studies help to answer the query: Is the annual output of physicians too large? Irresponsible statements often give rise to alarms and distort the real issue. Facts, on the other hand, when analyzed carefully, properly correlated with existing conditions and circumstances, and faced courageously, are not alarming, even in the slightest degree, and help carrying on with sureness and effectiveness. All of the studies made by this Association are based on facts and give only facts. Therefore, they serve a real purpose and are helpful.

APPLICANTS AND APPLICATIONS

Table 1 presents a summary of this study for the past five years. In 1933, 29,700 applications were made. By 1936 this figure increased by 20 per cent. In 1937 there was a 2 per cent drop, not a startling drop and, probably, with-

out significance. It is interesting that this increase in numbers of applications occurred with a decrease in the number of applicants. In 1933, there were nearly 600 fewer applicants than in 1936; but, in 1937, there was a very slight increase over 1936, so slight that it must be said that there has been no change in the number of applicants in 1937 over those of 1936. But, the same number of applicants in 1937 made 1,000 fewer applications than did the applicants in 1936. Did earlier application and acceptance by medical colleges dispel the need for making multiple applications? Or is there greater insistence on the part of applicants to get into a certain college—the first and only choice and that they prefer to wait another year, if rejected, rather than to be content with a second or third choice? It is true, that applications for admission are received as early as one year before attendance is anticipated. Some colleges have tentatively completed in January acceptance of the quota set for the freshman class

TABLE 1. SUMMARY OF TOTALS OF APPLICANTS AND APPLICATIONS AND ACTION TAKEN: 1933, 1934, 1935, 1936 AND 1937

	1933		1934		1935		1936		1937	
No. Applications	29,705		32,321		34,427		35,439		34,416	
No. Applicants	12,128		12,779		12,740		12,192		12,207	
Single Applicants	7,269		7,623		7,231		6,657		6,564	
Accepted	4,434	60.9%	4,433	58.1%	3,980	55.4%	3,538	53.1%	3,423	52.1%
Rejected	2,835		3,190		3,251		3,119		3,141	
Multiple Applicants	4,859		5,156		5,509		5,535		5,643	
Accepted	3,109	63.1%	2,986	57.9%	2,920	53.0%	2,927	52.8%	2,987	52.9%
Rejected	1,750		2,170		2,589		2,608		2,656	
Applicants (all) accepted	7,543	62.1%	7,419	57.9%	6,900	54.1%	6,465	53.0%	6,410	52.5%
Applicants (all) rejected	4,585	37.9%	5,360	42.1%	5,840	45.9%	5,727	47.0%	5,797	47.5%

which will enter in the Fall of that year. Or, are the numbers of multiple applicants (making more than one application) lessening? No; the multiple applicants are steadily increasing in numbers, whereas the single applicants (making only one application) are steadily lessening in numbers, which, doubtless accounts, in part, for the falling off in total numbers of applications made. Therefore, the reason for the fewer applications is not apparent.

Since 1933, the number of single applicants has decreased by 15 per cent, whereas the multiple applicants have increased by 25 per cent. However, the numbers of applications made by the multiple applicants has increased only 10 per cent. More will be said about this point later.

A significant fact is that since 1934 the number of applicants accepted has steadily lessened, from 57.9 per cent in 1934 to 52.5 per cent in 1937; or, converted into numerals, 1,000 fewer applicants were accepted in 1937 than were accepted in 1934. The 1937 freshman class is the smallest in ten years! Then, too, attention must be called to the fact that not all accepted applicants enroll. In 1937, nearly 11 per cent did not enroll. Are the medical colleges selecting more carefully? Is scholarship more of a criterion in acceptance than in previous years? Doubtless that is true (Table 3). And, on the whole, the size of the freshman class has steadily been reduced on the basis of available and usable teaching facilities. The rule agreed on in 1932 by the Council on Medical Education and Hospitals of the American Medical Association and this

Association that in the preclinical departments there shall be one full time teacher for each 25 students or major fraction thereof has been instrumental in reducing the size of classes. Perhaps, the demand that there be fewer graduates has also been a factor. Be that as it may, the number of medical students is slowly growing smaller.

Other, ancillary, factors come into play. It is well known that economic conditions are determinants in affecting the attendance in schools of higher education, especially the professional schools. Whenever business conditions are good, the attendance in the colleges falls off, and vice versa. So, we find that during the worst year of the depression, 1932, the attendance in medical colleges was the highest on record. Since then, with better business, the attendance has been growing less. At the moment, if information at hand is correct, and it probably is, 1938 will show another upward trend. Many medical colleges are reporting an increase in numbers of applicants.

With a mortality of about 15 per cent in every entering class, and an additional mortality of from 8 to 10 per cent in the succeeding three years, approximately from 23 to 25 per cent of the entering class will not graduate. To the number of members of every entering class must be added about 200 repeaters, of whom about 75 per cent fail to make good, a few repeaters in each of the next three years and those students who, for one reason or another, drop out for a while and who may not graduate until as long as ten years after their first matriculation. Lack of finances, illness, desire for further work in college, and repetition demand years of work before graduation is effected. But, the positive statement can be made that the signs for securing a better state of affairs in medical education are propitious. We are now graduating fewer and better prepared students, therefore the standards and efficiency of practitioners will be higher.

Do rejected applicants continue to try to secure acceptance? Yes, they do, but not to any great degree. Some of them go to foreign medical schools. Some return to college for further preparation. Many of them quit trying. A considerable percentage of college students who intend to study medicine begin to make application to medical colleges one year or even two years before they are ready to enroll. They want to know whether they are proceeding in the right direction; whether the record in college as far as they have gone is acceptable to a medical college. These students do not alter figures very much, but there are such. An individual canvass of this group has not been made, hence exact figures cannot be given.

The Women Applicants

The data on the women applicants are comparable with those on the male applicants, except that the women multiple applicants have increased in number to a greater degree than have the males. There were about 60 per cent more women multiples in 1937 than in 1933. The number of single applicants were about the same in both years. Does this mean that women are finding it more difficult to secure acceptance now than formerly? The number of women ap-

plicants is about the same for both years—only 10 less in 1937 than in 1933. It would seem that the difference in acceptance is wholly accounted for by selection, a conclusion which is strengthened by the fact that whereas in 1933, 62.3 per cent of all women applicants were accepted, only 52.4 per cent were accepted in 1937 (52.5 per cent males were accepted). The total of accepted women applicants has remained under 400 each year.

TABLE 2. SUMMARY OF TOTALS OF APPLICANTS AND APPLICATIONS AND ACTION TAKEN: 1933, 1934, 1935, 1936 AND 1937

	1933		1934		1935		1936		1937	
No. Applications	833		1,034		1,443		1,384		1,397	
No. Applicants	507		636		689		659		649	
Single Applicants	355		458		439		411		398	
Accepted	200	56.5%	262	57.2%	230	54.7%	216	52.5%	209	52.3%
Rejected	155		196		209		195		89	
Multiple Applicants	152		178		250		248		251	
Accepted	116	76.3%	122	68.5%	149	59.6%	157	63.3%	132	52.6%
Rejected	36		56		101		91		119	
All applicants accepted	316	62.3%	384	60.4%	379	55.0%	373	56.6%	341	52.4%
All applicants rejected	191	37.7%	252	59.6%	290	45.0%	286	43.4%	308	47.6%

ACCEPTANCE BASED ON COLLEGE WORK TAKEN

Table 3 shows the acceptance and rejection of both single and multiple applicants on the basis of the amount of college work taken. It supports the contention that it is not the amount of time spent in college or work taken as it is the scholastic standing of the applicant which determines acceptance or rejection.

It must be stressed at this point that the figures obtained from enrolment blanks are at variance with the figures given in this table, especially for the "less than three years" group. Many of those in this group who were accepted by

TABLE 3. DATA ON ACCEPTANCE AND REJECTION OF APPLICANTS ON BASIS OF YEARS OF COLLEGE WORK.

	Single Applicants		Multiple Applicants		
	Accepted	Rejected	Accepted	Rejected	Totals
1—2 years	2	7		1	10
2—3 years	493	377	105	154	1129
3—4 years	1187	793	559	531	3070
4 or more years	248	264	177	224	913
A. B. degree	772	579	1199	842	3392
B. S. degree	597	566	921	793	2877
Other degrees	25	34	12	21	92
Not stated	99	521	14	90	724
	3423	3141	2987	2656	12,207

medical colleges failed to enroll, probably because they had no intention of enrolling this year, preferring to continue their college work. Perhaps, they were among those applicants who were merely trying to find out whether they were acceptable; if not, they would change their course of study to meet requirements. As stated elsewhere, the number of students who have had less than three years of college work is lessening year by year. Those accepted, doubtless are a "hand picked" lot and represent a group of students who have a good scholastic record.

Of all accepted applicants, 9.2 per cent were in this group. Of these, 53 per cent were accepted. The three or more years group (no degree) was represented by 32.6 per cent, of whom 54.7 per cent were accepted. The degree group represented 52.1 per cent of all applicants of whom 55 per cent were accepted. Then there is a group of 724 students, about 6 per cent of all applicants, whose college work was not given, probably overlooked when the card was filled in, but only 15.5 per cent of these applicants were accepted.

These figures, for all groups, show definitely that there is not any discrimination in selection on the basis of amount of college work taken. Some other factor is the determinant. And this can only be scholarship. While many tests of various kinds are used by medical colleges, as well as personal interviews, as an aid to selection of students, it is, probably, safe to assert that the factor of scholarship has more weight than any other single factor. Even letters of recommendation, written by former college teachers or friends, do not have much weight in selection, although a considerable number of medical colleges still ask for such letters, probably with the thought that whenever a decision to accept or reject is a close one, such letters might prove to have value. The colleges claim that their letters "not to accept" are disregarded by medical colleges, which irks them considerably when such a student is later reported to them as having failed in medical college.

Applications and Enrolment

Table 4 shows, by colleges, the number of applications received; how many were accepted and how many students actually enrolled. These figures must not be confused. The first three columns show *applications;* the fourth column shows *applicants* enrolled.

Five colleges had more than 1,000 applicants; the highest number was 1,263. These five schools and 12 others enrolled more than 100 students. Nine schools (includes six two year schools) had fewer than 100 applications. Thirty-one (31) of these 78 medical colleges enrolled, each, less than 60 students.

Some colleges refuse to consider further applications as soon as they have made a sufficient number of acceptances to ensure the quota set for the class. If further applications are received, they are returned without further ado. These applications usually are not reported. Some schools do report such applications under the heading on the application card "no action taken." They are counted as being bona fide applications, if complete, but are not acted on in any way. Others may be acted on to the extent of evaluating credentials and if found acceptable, although the applicant cannot be given a place in the class because the number set is complete, the application is reported as "rejected because class full."

Exact figures on reasons for rejection of applicants are not given because they would not clarify the situation in any way. For instance, an applicant who made 40 applications to as many medical colleges, may have been rejected for any one of four reasons: class full; credentials inadequate quantitatively; poor scholarship or personality; poor work done in another medical school (a re-

TABLE 4—DATA BY COLLEGES ON TOTAL NUMBER OF APPLICATIONS MADE AND ACTION THEREON (MEN AND WOMEN) 1937

School	Applications			Applicants Enrolled
	Accepted	Rejected	Total	
Alabama	87	398	485	51
Arkansas	92	36	128	72
Medical Evangelists	91	92	183	92
California	61	286	347	60
Southern California	65	230	295	54
Stanford	84	236	320	60
Colorado	57	99	156	56
Yale	79	405	484	54
Georgetown	112	484	596	94
George Washington	99	492	591	69
Howard	56	190	246	35
Emory	73	196	269	59
Georgia	57	42	99	48
Chicago Medical	84	18	102	46
University of Chicago	161	748	909	88
Illinois	139	152	291	160
Loyola	96	433	529	70
Northwestern	180	895	1075	125
Indiana	128	315	443	115
Iowa	108	47	155	104
Kansas	107	252	359	68
Louisville	142	592	734	86
Louisiana	138	348	486	97
Tulane	201	255	456	126
Johns Hopkins	91	267	358	69
Maryland	116	353	469	89
Boston	71	372	443	49
Harvard	162	689	851	125
Tufts	132	247	379	100
Michigan	167	487	654	130
Wayne	61	138	199	67
Minnesota	116	243	359	100
Mississippi	34	21	55	23
Missouri	54	28	82	38
St. Louis	182	937	1119	119
Washington	166	452	618	80
Creighton	113	232	345	73
Nebraska	117	76	193	93
Dartmouth	21	94	115	20
Albany	36	430	466	35
Buffalo	109	679	788	75
Columbia	144	865	1009	110
Cornell (Ithaca)	57	669	726	20
Cornell (N. Y.)	25	185	210	57
Long Island	118	872	990	95
N. Y. Medical	76	686	762	87
N. Y. University	215	606	821	138
Rochester	73	456	529	50
Syracuse	55	585	640	48
Duke	72	436	508	71
North Carolina	37	46	83	37
Wake Forest	40	59	99	30
North Dakota	30	248	278	24

TABLE 4—Continued

School	Applications			Applicants Enrolled
	Accepted	Rejected	Total	
Cincinnati	109	406	515	73
Ohio	81	208	289	77
Western Reserve	126	632	758	78
Oklahoma	63	81	144	57
Oregon	79	368	447	65
Hahnemann	284	671	955	145
Jefferson	169	503	672	128
Pennsylvania	158	1105	1263	120
Pittsburgh	77	162	239	64
Temple	152	1014	1166	109
Woman's Medical	30	51	81	31
South Carolina	41	389	430	40
South Dakota	34	27	61	17
Meharry	76	57	133	79
Tennessee	174	158	332	30
Vanderbilt	58	556	614	51
Baylor	92	111	203	80
Texas	103	93	196	99
Utah	42	40	82	29
Vermont	32	28	60	31
Medical College of Virginia	118	437	555	81
University of Virginia	80	329	409	71
West Virginia	41	147	188	26
Marquette	148	438	586	100
Wisconsin	86	66	152	84

peater). These data have value only in the individual case, whenever a medical college wants to know whether one of their applicants has applied to some other school or schools and what action was taken on his application. Then, the reasons for rejection are specified.

Table 4, therefore, shows only the number of applications received by each college (which means for that school also the number of applicants); how many were accepted and how many rejected. Of those accepted, the number enrolled is shown in the fourth column. In the case of the state universities medical colleges, geographic limitation restricts the number of applications which can be considered, hence the figures for these colleges are rather low compared with those schools which are not limited by state boundaries in their acceptances. A few schools have set up for themselves regional limitation, as, for instance, Tufts and Boston University, preferring to limit enrolment so far as possible to students from the New England States. One school exercises a religious preference, limiting enrolment, in the main, to members of the religious group of which the school is a part. Meharry has a racial limitation. All of its students are Negroes. Howard accepts mostly Negroes but does have some white students. Thus, in all of these schools, the number of applications which may be received necessarily falls within definite limitations. True, exceptions are made (not at Meharry) but they are few in number and only for good and sufficient reasons. The exceptions do not increase the number of applications received even to a small fraction of 1 per cent.

TABLE 5.—DATA ON 5,643 MULTIPLE APPLICANTS:
NUMBER OF APPLICATIONS MADE, ACCEPTANCES AND REJECTIONS

1821 made 2 applications=3642
809 had no acceptances.
1012 had 1270 acceptances.
1 acceptance—754
2 acceptances—258

1090 made 3 applications=3270
465 had no acceptances.
625 had 879 acceptances.
1 acceptance—416
2 acceptances—164
3 acceptances— 45

707 made 4 applications=2828
301 had no acceptances.
406 had 599 acceptances.
1 acceptance—262
2 acceptances—103
3 acceptances— 33
4 acceptances— 8

474 made 5 applications=2370
206 had no acceptances.
268 had 413 acceptances.
1 acceptance—174
2 acceptances—118
3 acceptances— 66
4 acceptances— 40
5 acceptances— 15

345 made 6 applications—2070
167 had no acceptances.
178 had 280 acceptances.
1 acceptance—104
2 acceptances— 52
3 acceptances— 16
4 acceptances— 6

251 made 7 applications=1757
134 had no acceptances.
117 had 193 acceptances.
1 acceptance—71
2 acceptances—27
3 acceptances—13
4 acceptances— 3
5 acceptances— 1
6 acceptances— 2

171 made 8 applications=1368
96 had no acceptances.
75 had 115 acceptances.
1 acceptance—47
2 acceptances—19
3 acceptances— 6
4 acceptances— 3

136 made 9 applications=1224
79 had no acceptances.
57 had 74 acceptances.
1 acceptance—43
2 acceptances—12
3 acceptances— 1
4 acceptances— 1

103 made 10 applications=1030
64 had no acceptances.
39 had 49 acceptances
1 acceptance—32
2 acceptances— 6
5 acceptances— 1

85 made 11 applications=935
60 had no acceptances.
25 had 36 acceptances.
1 acceptance—18
2 acceptances— 5
3 acceptances— 1
5 acceptances— 1

71 made 12 applications=852
46 had no acceptances.
25 had 32 acceptances.
1 acceptance—20
2 acceptances— 3
3 acceptances— 2

62 made 13 applications=806
35 had no acceptances.
27 had 33 acceptances.
1 acceptance—22
2 acceptances— 4
3 acceptances— 1

58 made 14 applications=812
35 had no acceptances.
23 had 34 acceptances.
1 acceptance—18
2 acceptances— 1
3 acceptances— 2
4 acceptances— 2

37 made 15 applications=555
23 had no acceptances.
14 had 22 acceptances.
1 acceptance—10
2 acceptances— 1
3 acceptances— 2
4 acceptances— 1

35 made 16 applications=560
22 had no acceptances.
13 had 17 acceptances.
1 acceptance—11
2 acceptances— 1
4 acceptances— 1

27 made 17 applications=459
18 had no acceptances.
9 had 12 acceptances.
1 acceptance—6
2 acceptances—3

21 made 18 applications=378
12 had no acceptances.
9 had 12 acceptances.
1 acceptance—8
4 acceptances—1

TABLE 5—Continued

21 made 19 applications=399
11 had no acceptances.
10 had 15 acceptances.
1 acceptance—7
2 acceptances—2
4 acceptances—1

20 made 20 applications=400
11 had no acceptances.
9 had 11 acceptances.
1 acceptance—8
3 acceptances—1

15 made 21 applications=315
9 had no acceptances.
6 had 12 acceptances.
1 acceptance—4
3 acceptances—1
5 acceptances—1

10 made 22 applications=220
6 had no acceptances.
1 acceptance—4

11 made 23 applications=253
6 had no acceptances.
1 acceptance—5

3 made 24 applications=72
3 had no acceptances.

10 made 25 applications=250
7 had no acceptances.
3 had 5 acceptances.
1 acceptance—2
3 acceptances—1

10 made 26 applications=260
6 had no acceptances.
4 had 6 acceptances.
1 acceptance—2
2 acceptances—2

4 made 27 applications=108
2 had no acceptances.
1 acceptance—2

4 made 28 applications=112
3 had no acceptances.
1 acceptance—2

5 made 29 applications=145
3 had no acceptances.
1 acceptance—2

2 made 30 applications=60
2 had no acceptances.

2 made 31 applications=62
1 had no acceptances.
1 acceptance—1

2 made 32 applications=64
1 acceptance—2

2 made 33 applications=66
2 had no acceptances.

1 made 34 applications=34
1 acceptance—1

1 made 35 applications=35
No acceptances.

1 made 40 applications=40
2 acceptances—1

1 made 41 applications—41
No acceptances.

MULTIPLE APPLICANTS

Table 5 gives the data on the multiple applicants and how they fared as to acceptance. Whereas the single applicants have steadily diminished in numbers, the multiple applicants have, per contra, steadily increased in numbers by about 22 per cent since 1933. However, the acceptances of the multiples have fallen off by nearly 11 per cent in five years, 52.9 per cent in 1937 as against 63.1 per cent in 1933. The single applicants, on the other hand, have diminished by about 10 per cent in these five years, and their acceptances by 8.8 per cent. Which must be regarded as evidence that single applicants are more desirable for acceptance than the multiples.

The highest number of applications made by one person was 41—with no acceptances. In 1936, 45 was "tops." Approximately 32 per cent of the multiples made only 2 applications; about 40 per cent made from 3 to 5 applications; about 18 per cent made from 6 to 10 applications; about 8 per cent made from 10 to 20 applications; the remainder made more than 20 applications.

TABLE 6—GEOGRAPHIC DISTRIBUTION OF ALL APPLICANTS.

	Single Applicants	Multiple Applicants	Total
New York	817	1394	2211
Pennsylvania	471	625	1096
California	399	347	746
Illinois	450	250	700
Ohio	295	317	612
New Jersey	177	365	542
Massachusetts	137	329	466
Texas	276	140	416
Michigan	225	150	375
Indiana	189	50	239
Wisconsin	186	44	230
Virginia	151	59	210
Minnesota	159	50	209
Missouri	139	70	209
Georgia	143	65	208
North Carolina	125	82	207
Kansas	134	52	186
Kentucky	102	83	185
Iowa	147	36	183
Tennessee	143	33	176
Connecticut	59	113	172
Louisiana	135	28	163
Washington	71	90	161
Oklahoma	110	44	154
Nebraska	117	36	153
South Carolina	102	50	152
West Virginia	76	71	147
Maryland	97	47	144
Alabama	88	50	138
Mississippi	88	46	134
Florida	70	52	122
District of Columbia	75	36	111
Colorado	81	20	101
Arkansas	83	15	98
Oregon	66	27	93
Puerto Rico	25	65	90
Utah	43	25	68
Rhode Island	19	47	66
North Dakota	33	22	55
Vermont	44	10	54
Idaho	21	32	53
Maine	10	33	43
Canada	33	10	43
Montana	18	23	41
South Dakota	28	12	40
New Hampshire	18	19	37
Wyoming	9	9	18
New Mexico	7	10	17
Arizona	9	8	17
Hawaii	5	10	15
Delaware	8	7	15
Philippine Islands	8	6	14
Cuba	6	5	11
China	5	5	10

TABLE 6—Continued

	Single Applicants	Multiple Applicants	Total
Nevada	3	4	7
Panama	5	2	7
Mexico	4		4
Persia	2	2	4
South Africa	3	1	4
India	1	2	3
England	3		3
Alaska	1	1	2
Costa Rica	2		2
Germany	1	1	2
Egypt	1	1	2
Korea		2	2
Brazil	2		2
Iraq	1		1
Honduras	1		1
Sweden	1		1
Canal Zone	1		1
Nicaragua		1	1
Guatemala		1	1
British West Indies		1	1

Many of the multiples continue to make application year after year without being accepted. One of these made 70 applications in three years (35 the final year), became discouraged because of nonacceptance and went to a medical school in Edinburgh. No check has been made on all the multiples in this respect, therefore their ultimate fate is not known.

GEOGRAPHIC DISTRIBUTION OF APPLICANTS

The geographic distribution of the applicants always is interesting. In 1937, every state in the Union was represented by one or more applicants. The District of Columbia, the Canal Zone, Puerto Rico and Alaska also furnished applicants. Twenty-two foreign countries were represented by 134 applicants.

The largest number of applicants came from New York State (mostly the City of New York), representing nearly 20 per cent of all applicants, which was somewhat less than in 1936. Pennsylvania was second with about 9 per cent of all applicants. These two states, New York and Pennsylvania, furnished about 28 per cent of all applicants from, approximately, about 20 per cent of the total population of the United States. Six states, New York, Pennsylvania, California, Illinois, Ohio and New Jersey, furnished about 49 per cent of all applicants, with, approximately 40 per cent of the total population of the United States. The second group of six states furnished only about 16 per cent of all applicants. Thirty states furnished about 80 per cent of all applicants.

Maine furnished only 43 applicants, whereas the District of Columbia furnished 11 applicants; Puerto Rico, 90 applicants. Forty-three applicants were residents of Canada, which is a smaller number than went from the United States to the Canadian medical schools. From these figures it would seem that

there is no reason why Maine should have a medical college. Furthermore, Maine and all the other New England states are taken care of by two colleges which select their student body largely from these states.

This study makes available information not obtainable elsewhere and which can be used to good purpose in discussions concerning numbers of persons who want to study medicine, their preparation for the study of medicine, acceptance based on such preparation, numbers of rejections and reason for rejection. It answers many questions put by medical colleges who want to know something about certain applicants, questions which could not be answered without these files. During the years, the study has more than justified itself, which should be pleasing to those who have helped in the making of it.

Grateful acknowledgement is hereby made to the colleges whose contributions of material made this study possible.

Study of Premedical and Medical Scholastic Records of Students in the University of Illinois College of Medicine

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The following report presents the results of a study of the complete premedical and medical records of two classes which have passed through the College of Medicine of the University of Illinois and which graduated therefrom in June, 1936, and June, 1937, respectively. In 1933, a preliminary report was presented showing the relationship between certain factors in the premedical records of a single class and the standings of these students in the first year in the medical course. The present report covers these same factors for the same class as well as a second class which entered in the following year and relates these factors to the scholastic standings throughout the entire medical course.

The study includes the following materials:

(1) A statement of what happened to the entire membership of each of the two classes, with a brief reference to the accomplishments of the women in the group.

(2) The relationship between the scholastic average in all premedical courses and the medical record; and a similar study based on only the scholastic averages of the premedical courses in laboratory science.

(3) Briefly, the relationship of the scores in the medical aptitude test to the medical record.

(4) An analysis of the records in the medical school of students of various age groups.

(5) An analysis of the records of students in medicine according to the total amount of premedical credit presented, and also according to the amount of chemistry and zoology included in the premedical program.

A short explanation of the admission and grading procedures at the University of Illinois College of Medicine may help to clarify some of the data. Beginning with the autumn of 1931, incoming students were required to present scholastic averages in all premedical work of at least 3.5[1] (B–), with a minimum of 60 semester hours. For one or two years, a few candidates who had previously applied were admitted under the earlier requirements, i.e., with lower averages. In the medical school itself, grades are recorded in percentage figures with 70 passing and 75 considered a "C" grade on a letter system. Grades are given only in the first three years, the fourth year being largely practical or clinical and this record is reported as either satisfactory or not satisfactory. Wherever

1. 3.5 means an average half way between B and C in a four passing grade system as A, B, C and D.

reference is made below to the entire medical record, actually the grades of only the first three years are meant.

In 1932, 175 students entered the College of Medicine. Four years later, in June 1936, 116 of these individuals graduated. Of the 59 absent ones, 2 had died, 18 had been permanently dropped for scholastic reasons, 11 had been dropped but later readmitted, 13 had stayed out of school voluntarily for one or more years and had returned to be included in other classes, and 15 had withdrawn voluntarily and had not returned. Thus, in addition to the 116 graduates, 24 others were still in school with reasonable expectations of graduating later. The graduating class in June, 1936, totaled 139 students, including the aforementioned 116, 5 admitted as transfers and 18 who had started in earlier classes and who had dropped back a year or more for miscellaneous reasons.

TABLE 1
Fate of Students Who Began the Medical Course at the University of Illinois in the Fall of 1932 and 1933

Class	No. entered	Graduated in 4 years		In school but did not graduate in 4 years		Left voluntarily		Deceased		Left permanently for low grades	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1932	175	116	66.3	24	13.7	15	8.6	2	1.1	18	10.3
1933	175	126	72.0	24	13.7	8	4.6	1	.6	16	9.1
Total	350	242	69.1	48	13.7	23	6.6	3	0.9	34	9.7

Table 1 shows the extent to which the members of these two classes succeeded in the medical school. The bottom line, "Total," combines the two groups and gives some indication of what one may reasonably expect at Illinois of an incoming class.

The 1933 class did somewhat better, since of the original 175 who entered, 126 graduated in June, 1937. Of the 49 not present, one had died, 16 had left because of failures, 10 others had been readmitted after being dropped for poor work and were in school, 14 had lost time for other miscellaneous reasons, and 7 had withdrawn voluntarily and were not in school. There were however, 147 graduates in June, 1937, 21 of whom had taken more than four years since enrolling to complete the four-year course.

Nineteen women enrolled in the two classes. Of the 19, 12 have graduated, 3 are still in school having lost time for various reasons (chiefly scholastic), 2 withdrew and were married and 2 were dropped for unsatisfactory work. It would seem that these women did approximately as well as a group as their male classmates. Women are admitted to the college on exactly the same basis as men, there being no conscious discrimination either in admissions or in the course work.

The earlier study found that there was a higher correlation between the premedical averages and the first year in medicine than between the medical aptitude test and the first year in medicine. The present study carried these figures further, including the entire three years in medicine.

Table 2 presents the correlation figures. Since the medical aptitude test was not required in 1933 there are no data for that class. The correlations for the first year were computed for all students who completed one semester or more, since some were dropped or left at the end of the first semester. The correlations for the three years work included all students completing three years whether they graduated within the usual four years or took longer.

That most of the correlations are lower where the three years in medicine are included is probably to be expected. The big drop in the size of all of the

TABLE 2
Correlations Between Medical School Records and Premedical Averages for Members of the Classes Entering in 1932 and 1933

Class	Correlation between premedical average and				Correlation between premedical average in science only and				Medical Aptitude Test and			
	First year in Medicine		3 years in Medicine		First year in Medicine		3 years in Medicine		First year in Medicine		3 years in Medicine	
	r	P.E.	r	P.E.	r	P.E.	r	P.E.	r	P.E.	r	P.E.
1932	.49	±.039	.52	±.046	.57	±.035	.51	±.046	.42	±.046	.30	±.063
1933	.41	±.043	.37	±.052	.42	±.042]	.32	±.054	.....	.....	.....	.....

correlation coefficients for the 1933 class is harder to explain. The explanation probably lies in the fact that this class included far fewer of that held-over group of candidates with low premedical grades than did the 1932 class. The mean of the premedical averages of the 1933 class was 3.84 as compared with 3.72 for the 1932 group. Given one class with a wide range of intellectual ability and another with a relatively uniformly high level of ability and the former will tend to show a higher correlation coefficient with any measure of accomplishment, such as grades in the medical school. If all students in a class are equally capable, other factors than ability tend to cause high and low grades.

TABLE 3
Correlations Between Grades Earned in Different Years in the Medical School

Class entering in	"r" between 1st and 2nd year		"r" between 1st and 3rd year		"r" between 2nd and 3rd year	
	r	P.E.	r	P.E.	r	P.E.
1932	.66	.035	.60	.040	.67	.034
1933	.71	.030	.50	.045	.74	.027

Table 3 presents the correlations between the records for the different years in the medical school. The second and third columns show fairly high correlations between the first and second year records and somewhat lower correlations between those of the first and third year. These results are what would normally be expected. The fact that the correlation between the second and third year is approximately the same as that between the first and second year is surprising. It appears from this that there is no more of a break in the students' records at the end of the preclinical years than between the first and second year. For both classes the general average was somewhat higher with each advancing

year in the medical school ranging from 78.5 to 81.3 for the 1932 group and from 79.2 to 82.3 for the 1933 class. Since these averages were computed for the same students, i.e., only the successful ones, the rising averages must be due either to better adaptation to the school system or to more liberal grading in the upper years.

TABLE 4

Comparison of the Medical School Records of Members of the Two Classes of Differing Age Groups

Age Group	No. of Cases	No. graduated with class	No. continuing in school	Per cent successful in Medicine	Mean grades of successful group	
					of premedical work	of 3 years in medicine
1932 Class						
19 or less	18	16	1	94.4	3.98	82.8
20, 21 or 22	99	72	13	85.9	3.73	80.1
23, 24 or 25	33	17	8	75.8	3.54	79.2
26 and up	20	11	2	65.0	3.60	79.5
1933 Class						
19 or less	21	15	5	95.2	4.00	81.47
20, 21 or 22	107	85	14	93.2	3.83	81.20
23, 24 or 25	26	20	2	84.6	3.73	79.80
26 and up	16	6	3	56.2	3.95	81.33

NOTE: Only 170 students are used in each class, the remaining 5 in each case being readmitted after previous failures.

Table 4 compares the medical records of students of different ages in the two classes. For practical comparison they were grouped as indicated in the first column of the table, i.e., the youngest, or those under 20 when they first enrolled in medicine, those of average age—20 to 22, those slightly over age—23 to 25 and those who were definitely older than the average medical student—26 and up (to 40). Table 4 indicates that the youngest students are successful in considerably larger numbers than the oldest, and that the two older groups are less likely to stay through the four years. A study of the grades earned by those who did stay in school is not so productive and there is little to indicate that any one group was more successful than another in the ability to earn high grades.

A further analysis of the records of the different age groups showed that the older students were more prone to do unsatisfactory work in the first year. The percentages of the different groups whose first year's work was not acceptable follows, beginning with the youngest: 10.3, 12.6, 20.3 and 38.9. The two classes were combined to increase the number of cases. The conclusion appears to be justified that the very young students are more likely to prove satisfactory and successful in completing a course in medicine than are those who are above the average age for entrance.

The medical school records of the two classes, grouped according to the amount of premedical college credit presented for admission, are analyzed in Table 5. In each class the group with only two years of premedical work was the most successful, judging success by the number who completed the course. On the other hand, the members of the group who had completed three and one-half or more years of premedical work and who were successful in medicine averaged slightly higher in grades than did any other group, although there was

nothing in their premedical grades to cause such an expectation. No reason is known for these seeming discrepancies. Perhaps, the added years of education tend to give students a better background and more training, while many of them develop other interests which in some cases lead to changes in plans after actually starting the course. Hence, more drop out but those who stay are able to earn better grades.

TABLE 5

Comparison of the Medical School Records of Members of the Two Classes Who Presented Varying Amounts of Premedical Credit

Amount of premedical credit	No. of cases	No. graduated with class	No. continuing in school after 4 years	Per cent successful in medicine	Mean grades of successful group	
					in premedical work	in 3 years in medicine
1932 Class						
60-66 hours	67	46	12	86.6	3.76	79.8
67-84 "	44	29	8	84.7	3.77	80.3
85-104 "	26	21	0	80.8	3.72	80.5
105- "	33	20	4	72.7	3.50	80.9
1933 Class						
60-66 hours	54	44	9	98.1	3.83	80.7
67-84 "	52	36	8	84.6	3.87	81.2
85-104 "	34	24	6	88.2	3.76	80.6
105 or more	30	22	1	76.7	3.90	81.8

A careful analysis of the records of the two classes based on the amount of chemistry and zoology completed in the premedical program was also made. The minimum requirements for consideration when these students were admitted were 8 semester hours of zoology, including a course in vertebrate, and 12 semester hours of chemistry, including at least 4 hours of organic chemistry. Comparisons of the premedical and medical grades of groups with different amounts of chemistry and zoology showed nothing of significance. Students with the minimum in each field, taken collectively, seemed to earn as high grades in medicine as those who had taken extra elective courses in these fields.

A study, similar to that outlined above, is being started on each class as it enters the College of Medicine of the University of Illinois and each year will find the data of one more class added to the foregoing data. Whether facts of enough significance to influence admission procedures will be found remains to be seen. In any case it seems of value to know what does happen to the students who enroll year after year.

Although the study includes too few cases to justify general conclusions, the following statements seem to be indicated:

(1) Somewhat more than 80 per cent of the individuals who enter this medical school continue through and receive M.D. degrees.

(2) Women are approximately as successful in the medical course as men.

(3) The younger students are somewhat more successful than the older.

(4) Nothing in the study indicates that men with three or four years training are more desirable medical students than those with only two years.

(5) As the qualitative grade requirements for admission are raised, the correlation between premedical records and medical grades seems to fall.

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Value of Greek and Latin in Scheme of Education

The following excerpt from an address delivered by Dr. Paul D. White, Boston, is highly significant.

"It is, indeed, a pity that this golden age of medicine does not coincide with the golden age of literature. Many important facts and ideas are buried, or at least in part concealed, by verbose or clumsy or otherwise inferior writing. In this matter the early education and environment of the doctor are often at fault. Not only has much of the fundamental cultural training of the youth been neglected, but even the rudiments of penmanship, spelling, grammar and literary style are often too hastily covered to establish good habits in the student of the present generation. It has become almost a commonplace that the average doctor writes illegibly, spells atrociously, constructs barbaric sentences and paragraphs and has an uncouth literary style. Since it is impossible to tell in childhood who will be the writers of medicine in the next generation, it would be wise to require of applicants for admission to the medical schools in the future a truly classical as well as a scientific fundamental education. The inclusion of Greek and Latin in language and literature, French and German, English in all its aspects, and history and archaeology in the premedical curriculum might easily make the difference between enjoyment and profit on the one hand and disappointment and neglect on the other, both in the reading and in the writing of important medical scientific papers and treatises. More and more we shall realize the truth of this, and shall strive to emerge from the barbarism of the medical literature of today to a higher level."—Gerrish Memorial Lecture: Doctors and Books. New England J. Med., 218:338-343 (Feb. 12), 1938.

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Internships in German Hospitals Available to American Graduates

There are available to graduates of American medical colleges this year five internship exchange scholarships in German university hospitals. An American may exchange his internship here with the graduate of a German medical school, although he need not intern in the hospital to which the German has been assigned. The American has his choice of hospitals. The American will receive from the German government from $25 to $30 pocket money per month and maintenance. It is expected that the German will receive a similar amount from the American hospital in which he will intern. At the completion of the intern year, both men will return to their own country. These are the conditions on which these internships in Germany have been made available.

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Foreign Medical Students

In 1933, Dr. Ray Lyman Wilbur, chairman of the Council on Medical Education and Hospitals of the American Medical Association, appointed a Committee on Foreign Medical Students, consisting of Drs. Harold Rypins, chairman, W. C. Rappleye, Fred C. Zapffe, Walter L. Bierring and Wm. D. Cutter. This committee was charged with dealing with the problem of Americans migrating to foreign medical schools.

At a meeting of this Committee, held in Chicago, February 19, 1938, the

Council on Medical Education and Hospitals announced that inasmuch as the Committee had not succeeded in preventing considerable numbers of poorly qualified students who studied medicine in one of the extramural medical schools of Scotland from securing a license to practice medicine in the United States, and since nearly all of these students are residents of New York and are licensed in New York, the Council is unwilling to continue the endorsement of the Medical Students' Qualifying Certificates issued by the New York State Department of Education.

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Foreign Student Exchange

Any medical college which is interested in sending a junior student on an exchange basis to a German medical school, or which has in its junior student body a member who would like to spend one year in study abroad, may secure further information on this subject by notifying the office of the Association. The number of such scholarships is limited, hence immediate action is important.

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Physiologist for Guatemala

The Teacher Placement Bureau has received a request from the Universidad Nacional Facultad de Ciencias Medicas, Guatemala, C. A., to provide full time professors of experimental physiology and bacteriology to whom all necessary laboratory facilities will be offered. Men who speak Spanish are preferred. Men who may be interested in these positions should correspond with the dean of the faculty, Dr. Lizardo Estrada G. at the above address.

This activity of the Association of American Medical Colleges is attracting world wide attention and many commendations are being received on its organization. Applications for placement in other medical schools are on file. Further information on these applications may be obtained at the office of the association.

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Hospital Data

The study on hospital service in the United States which was made by the Council on Medical and Hospitals of the American Medical Association (J.A.M.A., March 26, 1938) shows that the Council has approved of 6,128 hospitals as such; of 732 hospitals for intern training and 465 hospitals for residencies (954 hospitals excluding duplicates). In the 732 hospitals approved for intern training, there are available 7,223 internships. Because of longer duration than one year of some of these appointments, only 5,510 internships are available annually, somewhat more than the number of graduates from the medical colleges of the United States.

Departments of pathology exist in 4,527 approved hospitals—3,592 being under the direction of a pathologist; 4,894 hospitals have their own x-ray departments—4,123 being in charge of a radiologist; 2,169 hospitals also conduct an outpatient department.

The report shows clearly that each year more hospitals are becoming conscious of an educational duty by way of offering facilities for study to the staff and to recent graduates and others who are eager to continue their studies in preparation for practice, either in the general field of medicine or in a specialty. This is most encoruaging and definitely in line with present trends in medical education, especially in the graduate field.

College News

University of Cincinnati
College of Medicine

Dr. Frank B. Cross, for many years secretary of the faculty, died recently after a long illness. His interest in the college never wavered. From his sick bed he attended to his duties as publicity agent of the college. Dr. Cross' death leaves a void which it will be difficult to fill.

The following gifts have been received by the college:

From the Rockefeller Foundation, $7,500 per year for five years, to aid in the study in nutrition conducted by Drs. Tom D. Spies and Charles D. Aring, and $3,000 for aid in equipping the laboratory in neuropathology under the joint direction of Dr. Joseph P. Evans and Dr. Charles D. Aring.

From the Josiah H. Macy Jr. Foundation, $4,500 to assist in the pellagra prevention work of Dr. Tom D. Spies. This work is being carried on at the Hillman Hospital in Birmingham, Ala.

A bequest of $10,000 from Mrs. Ida B. Rulison, the income of which is to be used for worthy and needy students in the college.

From Miss Mary Hanna, $2,500 for aid in the work of the heart station under the direction of Dr. Johnston McGuire.

From Miss Mary Hanna, $2,500 to aid in the research work of the department of surgery.

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Stanford University
School of Medicine

The fifty-sixth course of popular medical lectures is being delivered at Lane Hall April 1 and 22; May 6 and 27.

The lecturers and their subjects are: (1) Dr. Walter W. Boardman, "Conditions of the Mouth in Relation to Disease;" (2) Dr. Donald E. King, "Backache; Causes and Treatment;" (3) Dr. Wm. J. Kerr, "Forty, Fat and Florid, and Heading for Circulatory Failure;" (4) Dr. Dwight L. Wilbur, "Vitamin Facts and Fallacies."

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University of Oregon
Medical School

A gift of $100,000 has been received from the Rockefeller Foundation for expansion of the school's library facilities. A new wing will be added to the medical school building at a cost of about $200,000, part of which will be obtained from other gifts. The new appropriation brings to $800,000 the contributions of the Rockefeller Foundation to the Portland medical center.

Dr. Eugene M. Landis, assistant professor of medicine, University of Pennsylvania School of Medicine, Philadelphia, delivered the annual Noble Wiley Jones Lectures, February 9-10. Dr. Landis's topics were "Capillary Pressure, Capillary Permeability and the Movement of Fluid Through the Capillary Wall" and "The Effects of Pressor Drugs and Kidney Extracts on Blood Pressure and Peripheral Blood Flow."

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Tulane University of Louisiana
School of Medicine

Dr. Guy A. Caldwell, of Shreveport, has been appointed professor of clinical orthopedics.

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Columbia University
College of Physicians and Surgeons

Dr. Philip E. Smith, professor of anatomy, has been made a knight of the French Legion of Honor.

A gift of $180,000 from the Martha M. Hall Foundation to be applied to new laboratories for graduate medical education, has been announced. The Martha M. Hall Foundation was estab-

lished in memory of the founder's father, William Henry Hall, "for the benefit and advancement of public and private charitable and scientific objects and purposes." This contribution supplements grants of $290,000 from the Commonwealth Fund toward the building program, and $50,000 from the Josiah Macy Jr. Foundation, toward the research and teaching program, advancing the extensive graduate medical plan to $680,000.

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Syracuse University
College of Medicine

Dr. Philip B. Armstrong, M.D., has been appointed professor of anatomy to succeed Dr. Henry W. Stiles who retired July 1, 1937.

Dr. Armstrong was a member of the department of anatomy at Cornell from 1925 until 1937, since which time he has been professor of anatomy at the University of Alabama School of Medicine. Dr. Armstrong will begin his duties at Syracuse July 1, 1938.

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University of Illinois
College of Medicine

The Gehrmann Lectures for 1937-1938 were delivered March 23, 24 and 25, by Dr. Thomas M. Rivers, director of the hospital of the Rockefeller Institute for Medical Research. His subject was "Viruses and Virus Diseases." One lecture was devoted to poliomyelitis. This was the thirteenth series of lectures, the first having been delivered in 1926.

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University of California
Medical School

Dean Langley Porter, who is also Chairman of the Division of Medical History and Bibliography, has arranged a series of open forum meetings on medical sociology. These were sponsored by the division and were held on Wednesday evenings, beginning on February 2, 1938. Dr. Salvatore P. Lucia, M.D., 1930, presided at the meetings. Each subject was presented by an authority in the particular field, and, after the talk, there was opportunity for free discussion. Following is a list of subjects: Cost of Medical Care, Theory of Health Insurance, Adequate Health Insurance Benefits, Health Insurance in the United States, Actuarial Principles of Insurance and Health Insurance, The Physician's Place in the Community, Health Insurance in Germany, Health Insurance in Great Britain, Organized Medicine and Health Insurance, The Relationship of Government to Medicine.

During February, Dr. George Tucker, who is a medicolegal consultant in Los Angeles, gave a series of talks which included: The Legal Aspects of the Practice of Medicine; Medical Records and Their Legal Effect; Medical Evidence in the Courts; Malpractice Liabilities and Defenses.

Sir Arthur Newsholme, formerly principal medical officer, Local Government Board of England, and the author of many books on social medicine, visited the Medical School late in February. The staff and students were privileged to hear Sir Arthur give a splendid talk.

Dr. George Pickering of University College Hospital, London, has accepted an invitation to give the 1938 Herzstein Lectures. These lectures, which have been provided for through a bequest in the will of the late Dr. Morris Herzstein of San Francisco, are given alternate years under the auspices of Stanford University School of Medicine and the University of California Medical School. Dr. Pickering is associated with Sir Thomas Lewis and is an authority in the field of hypertension, renal pressor substance and vascular spasm. The subjects of the lectures and the exact dates on which they are to be given will be announced in the newspapers throughout California.

Dr. A. Stampar, expert on health matters, attached to the League of Nations Health Section, addressed the faculty, resident staff and fourth year students April 13. Doctor Arvid Lindau,

professor of general pathology and bacteriology, University of Lund, spoke April 18, on "Nutrition and Gastro-Intestinal Disease," covering an extensive social and hygiene investigation which he made in the northern part of Sweden.

As part of the Alumni Day program, Dean Langley Porter gave the annual Alpha Omega Alpha Lecture, on "The Controversy between Liebig and Pasteur."

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Western Reserve University
School of Medicine

Dr. James Angus Doull, professor of hygiene and public health, attended the International Leprosy Congress in Cairo, Egypt, in March, as the representative of Western Reserve University, the College of Physicians and Surgeons, Philadelphia, and the Medical Advisory Board of the American Leprosy Foundation.

Dr. Harry Goldblatt, professor of experimental pathology, is the recipient of the John Phillips Medal awarded by the American College of Physicians "for outstanding contribution in the field of internal medicine or its allied sciences." Dr. Goldblatt's work was on hypertension in its relation to diseases of the kidney.

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George Washington University
School of Medicine

Dr. Winfred Overholser, recently appointed superintendent of Saint Elizabeth's Hospital, Washington, D. C., delivered the Smith-Reed-Russell lecture, February 24. A luncheon in honor of Dr. Overholser was given by Dean Earl B. McKinley at the Cosmos Club following the lecture at which faculty members, representatives of the medical services of the Army, Navy and Public Health Service and invited guests from Baltimore and New York attended. Announcement of the appointment of Dr. Overholser to fill the chair of psychiatry vacated recently by the death of Dr. William Alanson White was made. Dr. Overholser will assume his duties as professor of psychiatry and executive officer of the department of psychiatry with the opening of the fall session in September, 1938.

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University of Colorado
School of Medicine

Dr. Louis Hamman, associate professor of medicine, Johns Hopkins University School of Medicine, delivered the Henry Sewall lectures and conducted daily clinics at the medical school.

Promotions and new appointments: Philip Work, professor of neurology and head of the department of neurology; Constantine F. Kemper, associate professor of medicine; Harry Gauss, assistant professor of medicine; Edwin L. Harvey, Jr., assistant professor of obstetrics and gynecology; Harold L. Hickey, assistant professor of otolaryngology. Howard John Shaughnessy, former assistant professor of bacteriology and public health at the University of Illinois College of Medicine, was appointed associate professor of bacteriology and public health to fill the vacancy occasioned by the retirement of Severance Burrage.

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Long Island College
of Medicine

The second Adam M. Miller Memorial Lecture was delivered at the Long Island College of Medicine March 23, by Dr. George L. Streeter of the Department of Embryology, Carnegie Institution of Washington. The topic of his address was "Some Recent Advances in our Knowledge of Early Stages of Development in Primates."

The lectureship, which is an annual one established in honor of the late Adam M. Miller, former dean and professor of anatomy at the Long Island College of Medicine, was inaugurated during the past academic year by Sir Joseph Barcroft, professor of physiology, University of Cambridge, England, who spoke on "Certain Aspects of Embryo-physiology."

Jefferson Medical College

Dr. Michael A. Burns, professor of neurology, died March 7, 1938, at the age of 53. He graduated from Jefferson Medical College in 1907 and served as intern at St. Agnes Hospital, Philadelphia. He entered the neurologic service of Jefferson Medical College and Hospital in October, 1908, and served successively as demonstrator, lecturer, associate, assistant professor, and associate professor. He was appointed professor of neurology in May, 1934.

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Northwestern University
Medical School

Establishment of the Milton S. Florsheim Heart Institute is made possible by the receipt of a gift of more than $100,000 from the wife of the late Mr. Florsheim. It is provided that the income from the gift shall be expended in the employment of technical and research personnel for the study of diseases of the heart, in the purchase of equipment and supplies for such studies and in the publication of the results of such study.

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New York Medical College

At the annual dinner of the trustees, staff and faculty of the college and its associated hospitals, addresses were delivered by Dr. Arvid Lindau, professor of pathology and bacteriology at the University of Lund, Sweden, and Dr. Fordyce St. John Barker, professor of clinical surgery in Columbia University College of Physicians and Surgeons. Dr. Einar Hammarsten, professor of chemistry in the Carolingian Medical University, Stockholm, Sweden, will deliver a lecture under the auspices of the College May 2 in the Hecksher Foundation Theater.

The late Adolph L. Gondran bequeathed $100,000 to the Fifth Avenue Hospital, an affiliate of the College. Legacies of $10,000 each have been received by Flower Hospital and the College.

Indiana University
School of Medicine

Many departments of the Indianapolis unit now occupy the new Clinical building, recently completed at the University Medical center. The six story brick building, financed by PWA funds, was erected and equipped at a cost of more than $600,000. The building is designed as a "nerve center" for its surrounding campus units; the Robert W. Long general hospital, the William H. Coleman Hospital for women, the Ball Residence and Training School for nurses, and the James Whitcomb Riley Hospital for children. Administrative offices for all these hospitals will be located in the new Clinical building.

The Department of Bacteriology and Pathology has been divided into separate departments, with the Department of Public Health being merged with the bacteriology division.

Dr. Thurman B. Rice, who has been serving as chairman of the original department, becomes chairman of the new Department of Bacteriology and Public Health. Dr. Frank Forry is the new chairman of the Department of Pathology.

The latter department has two divisions, one of general pathology with Dr. Forry as chairman, and a division of clinical pathology with Dr. Clyde G. Culbertson as chairman.

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Johns Hopkins University
School of Medicine

Dr. E. V. Cowdry, professor of cytology, Washington University School of Medicine, St. Louis, delivered the DeLamar Lecture April 19. His subject was "The Cellular Changes in Leprosy."

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University of Arkansas
School of Medicine

Dr. Ernest H. White, associate professor of obstetrics and gynecology, has been appointed professor, succeeding the late Dr. Shelbey B. Hinkle.

General News

Child Neurology Research

The council of Child Neurology Research, set up by the Friedsam Foundation, announces that applications for grants will be considered at the meetings to be held in April and October of each year. The purpose of the council is to encourage original research on definite problems coming within the scope of child neurology and allied fields.

Applications must be in the hands of the director, Dr. Bernard Sachs, 116 West Fifty-ninth Street, New York, before April 1 and September 15. The applicant must state distinctly the problem under investigation and the methods to be pursued.

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Chicago Tumor Institute

Besides offering consultation service to physicians in the diagnosis and treatment of cancer and radiation facilities for cancer patients, the Institute also proposes to conduct research and to offer training to physicians who may wish to qualify as specialists in the study and treatment of this disease.

The Institute is located at 21 West Elm Street, Chicago. The Scientific Committee consists of Dr. Max Cutler, Director; Sir G. Lenthal Cheatle, Dr. Henri Coutard, Dr. Arthur H. Compton and Dr. Ludvig Hektoen.

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Institute of International Education

Correcting a statement made in a recent issue of the JOURNAL that this Institute has not placed graduate students in foreign countries: During the last few years there have been four exchange arrangements between American and foreign doctors of medicine under the auspices of the Institute. In addition, there have been ten American physicians who have had the advantage of study in Europe on medical fellowships secured through the Institute, and seven foreign physicians have studied in the United States on medical fellowships secured through the Institute. Also there have been several Americans under the auspices of the Institute who have taken premedical courses in Germany before entering medical schools in this country.

The Institute also administers the fellowship offered by the Medical Faculty of the University of Geneva in alternate years, and several Americans have held this award. It is again offered for 1938-1939. American physicians have held the fellowships of the Czechoslovak and Hungarian governments which the Institute administers for this country. An American physician also is eligible for one of the government fellowships in Italy.

It is well known that the Institute has been very active in promoting foreign fellowships in other fields of learning and that many hundreds of Americans have enjoyed these benefits thanks to the Institute.

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Commonwealth Fund Graduate Fellowships

The Commonwealth Fund has made available to members of the Maine Medical Association fellowships in medicine, pediatrics, obstetrics and office surgery at the Harvard Medical School. The duration of a fellowship is one month, although a fellow may enroll again in subsequent years if a fellowship is available. The stipend is $250, plus tuition and an allowance of $25 for travel expense.

Applicants must be graduates of an approved medical school, members of the Maine Medical Association in good standing, must have been in practice at least five years and should be, preferably, under 45 years of age, and must

be residents of communities of less than 10,000 population.

Application blanks may be obtained from the division of public health, Commonwealth Fund, 41 East 57th Street, New York City, or from Dr. Frederick R. Carter, Secretary Maine Medical Association, 22 Arsenal Street, Portland.

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Herzstein Lectures

The sixth course of the Morris Herzstein Lectures, sponsored by Stanford University and the University of California medical schools, will be held May 23-26 in San Francisco at the University of California Extension Division, 540 Powell Street. The speaker will be Dr. George L. Pickering of the department of clinical research of the University College Hospital Medical School, London, England.

Dr. Pickering will speak on hypertension, the renal pressor substance and the biological significance of pain.

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Scholarship in Psychiatry

A Wooley scholarship in psychiatry in Paris is available for the coming year. The scholarship consists of a room in the United States House of the Cité Universitaire and a grant of $600 for a year beginning October first. Candidates must be American citizens, men or women, with a good knowledge of French. The candidate must have obtained the M.D. degree or be in the last year of study for that degree. Only unmarried candidates will be accepted.

Application blanks may be secured from the Institute of International Education, New York City.

Alpha Epsilon Delta

The fifth biennial convention of this honorary premedical convention was held in Chapel Hill, North Carolina, March 25 and 26. Twenty-one chapters were represented. Notable speakers were Dr. Addison G. Brenizer, of Charlotte, North Carolina, and Dr. Wm. deB. MacNider, dean and professor of pharmacology, University of North Carolina School of Medicine.

Dr. Charles F. Poe, professor of chemistry, University of Colorado, was elected president; Dr. Maurice L. Moore, Drexel Hill, Pennsylvania, secretary-historian.

◆ ◆

Summer Courses for Foreigners in German Medical Schools

It is reported that German universities, with the permission of the authorities, are preparing courses of study in medicine for the summer months especially for foreign students. These courses will be open to undergraduates only and, it is said, that no fees will be charged. Travel and living expenses must be met by the student, although it is possible that even maintenance will be provided for. Exact details as to the plan will be available later and will be published when received.

Such opportunities have been available for sometime to English and French students. About 1,000 English and 800 French students (medical) have attended these courses in the past two years. Choice of university and subjects rests with the students. Attendance is certified; subject credits are not given.

Abstracts of Current Literature

What the Medical Student Should Be Taught About Vital Statistics

Much of the future of preventive medicine, in its broadest sense, rests with the private practitioner of medicine as contrasted with those technically trained as professional workers in public health. Since most medical students are general practitioners in embryo, it is the teacher's responsibility to add to their background anything that will contribute to the effectiveness of the part they play in prevention in the future. This type of approach not only justifies but makes mandatory the inclusion of much material not essential to the training of the physician of the past. In all probability, the future will see the medical man, by reason of his position in the pattern of community mores, having a close relationship to social evolution, in which case he will have to be able to follow intelligently, and to judge with discrimination, much work which will be expressed in the terminology of vital statistics.

The student should know the principles of tabular and graphic presentation of data, not only because he may wish to present data, but also because he will inevitably encounter such data in his professional journals and should recognize the pitfalls of bad presentation and the possibilities inherent in optical illusions. A practical field which merits more attention than it is getting covers history forms, survey blanks and other record sheets, and the methods of manipulating such records including mechanical sorting and tabulating. Familiarity with this field is advisable not because the doctor will necessarily use such methods, but, what is more important, an understanding of the technic will make for cooperation on the part of medical men, whereas ignorance usually leads to lack of cooperation or even active opposition. This is the reason for giving the medical student an understanding of statistical technic which the general practitioner will never have to use.

It is not necessary or advisable that the medical student should be harassed with formulae or mathematical symbols.

A discussion of sampling can be offered leading up to the probable error concept, at the end of which the student knows what is a probable error and no longer confuses it with instrumental error or errors of observation. Under the heading of probable error comes the whole question of differences and their significance. A great deal of scientific work, especially in medicine, hinges on the delineation of differences; the difference between an experimental and control group or between a treated and untreated group; and it is not difficult to arrest the attention of even the most clinically minded medical student with discussions of this particular segment of the field of probability. In this way many students develop a caution and discrimination in scientific judgment which is one of the most important traits the student can acquire, and I know of no better way of getting it than by a proper contemplation of the theory of sampling and probability. The cultural and maturing effects of this subject are such that one need offer no apologies for time spent on it, and the gratitude of the better students for having been introduced to the field is testimony of its worth.

In connection with rates and ratios, the various forms of death rates, case fatality rates, and morbidity rates are discussed mainly with the idea of stressing in the student's mind how crude the crude death rate is and how important it is to have a clear concept of those "exposed to risk." The age specific death rate leads smoothly into the life table, which is presented for just what it is,

the most compact method of presenting the essential facts about age distribution of mortality. The student will not be able to construct a life table, but at least he will know the difference between the mean age at death and the so-called life span, a distinction that eludes most of our best physicians. Under this same treatment of death rates is presented the death certificate and with special reference to the *International List of Causes of Death*. Quizzing is designed to bring out the relative value of different rubrics from a scientific standpoint, and when correlated with necropsy work by the department of pathology it may be shown how difficult it may be to assign a principal cause of death in many cases. Such an approach gives the student a real interest in the death certificate. In our classes each student is presented with a copy of *The Physician's Pocket Reference* as published by the Bureau of the Census, but, what is most important, every final examination includes at least one question on the certification of death and these questions are such as to challenge the mettle of even the best students. This engenders a respect for certification and also results in a great deal of discussion among the students outside of class hours.

The time necessary to achieve the approach outlined is not excessive. Ten to twelve 1 hour lectures with an equivalent amount of time for quizzing is enough though this will mean hard work for both teacher and student. The teacher must have his material well organized so that there is no waste motion and the student must have enough intellectual stamina to follow a difficult lecture up to the last minute. Any additional time available can be used advantageously in developing such broad aspects of human biology as fertility, population problems, and the more refined technics of investigation, such as the Chi-square test and its application to the fourfold table. I do not consider these last essential to the rank and file of medical students but it is surprising how, especially in late years, a demand is growing among the students to have such topics included in the regular work. Laboratory work would be highly desirable, but in view of the already overcrowded medical curriculum it is very unlikely that such exercise can find a place in undergraduate work.

For the text to be used in connection with lectures and quiz sections, there is none that equals Pearl's *Medical Biometry and Statistics*. Many questions about the teaching of the subject are still unanswered and remain matters of opinion. There is the question as to what year in the medical course is best. The answer may vary from any one of the four to all of them, that is, spreading the work over four years. We chose the last half of the sophomore year. The student has had most of the basic sciences by this time but has not yet been completely seduced by the bedside aspects of disease. This is the most opportune time to expose his mind to the influences of this course.

By long odds, the greatest proportion of data in the field of public health originates in the hands of the physician. Any training he gets as a student, during his formative years, which leads to a better understanding and appreciation of such data will probably emerge some time on the credit side of the public health ledger. Le Blanc, Thos. J., Professor of Preventive Medicine, University of Cincinnati College of Medicine.—*Am. J. Public Health*, 27:1273-1276 (Dec.), 1937.

Book News

The Compleat Pediatrician: Practical, Diagnostic, Therapeutic and Preventive Pediatrics

By Wilburt C. Davison, M.A., D.Sc., M.D. Professor of Pediatrics Duke University School of Medicine. 2d Ed. Duke University Press, Durham, N. C. 1938. Price, $3.75.

That this book has made a place for itself in the library (bag or pocket) of the physician is evidenced by the fact that a second, carefully and completely revised edition becomes a necessity. To present all the merits of this work would demand many pages of type; in fact, another "Compleat Pediatrician." If one wants to know anything at all about children, their diseases, nutritional requirements, feeding, diets, general treatment and nursing, growth, development and care, what drugs have value in treating children and how to combine them in prescription, this book gives the answer. It gives the answer to virtually every pediatric problem. It is encyclopedic in scope, yet is a handy reference. Incidentally, aside from its professional value, much pleasure is derived from its use because of its uniqueness. It should have real value for student and practitioner. The author is to be commended for having done a worthwhile job in splendid manner.

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Pneumonia and Serum Therapy

By Frederick T. Lord, M.D., Clinical Professor of Medicine, Emeritus, Harvard Medical School, and Roderick Heffron, M.D., Field Director, Pneumonia Study and Service, Massachusetts Department of Public Health. Revised Edition. The Commonwealth Fund, New York. 1938. Price, $1.

This handbook discusses fully the use of antipneumococcic serum in the treatment of pneumonia, with special attention to clinical diagnosis, selection of cases for serum treatment, identification of pneumococcus type, technic of administering the serum, precautions to be observed, possible reactions and their treatment and results of serum therapy. Discusses the use of rabbit serum, sets forth in detail the organization of a pneumonia control program. A very handy and useful book.

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Clinical Roentgen Therapy

By 17 contributors. Edited by Dr. Ernst Pohle, Professor of Radiology, University of Wisconsin. Lea & Febiger, Philadelphia. 1938. Price, $10.

This is the first comprehensive text on roentgen therapy in the English language. The book covers all of the accumulated knowledge in this field and presents in detail the latest technique. The contributors are well known in this field which guarantees the value of the text. The radiologist will find this book a guide in the treatment of conditions amenable to irradiation. The chapter on the medicolegal aspects of injuries following the application of roentgen rays, though brief, is excellent and should prove valuable to every specialist in this field who may have to give evidence in court as defendant or expert witness.

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X-rays and Radium in the Treatment of Diseases of the Skin

By Dr. George M. McKee, Professor of Clinical Dermatology, New York Post Graduate Medical School (Columbia University). 3d Ed. Lea & Febiger, Philadelphia. 1938. Price, 10.

This book reflects the latest established theoretical principles of roentgen therapy and their practical application. It is a conservative text restricting itself to those uses of these agents in which the results are sure and pointing out the various pitfalls that make their use dan-

gerous in unskilled hands. It correlates the specialized knowledge of the dermatologist and radiologist and includes the essential elements of physics and biology. The remarkable increase in knowledge of physics, biochemistry, histopathology and technic as applied to x-rays and radium has all been utilized and to that end many of the chapters of this edition have been revised and rewritten by collaborators who are specialists in these fields. This third edition is really a new book. Material that has become obsolete has either been omitted or briefly described, but everything which experience has shown to be of value has been included.

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Operative Gynecology

By Harry S. Crossen, M.D. and Robert J. Crossen, M.D., respectively, Professor Emeritus of Clinical Gynecology, and Assistant Professor of Clinical Gynecology and Obstetrics, Washington University School of Medicine. 5th Ed. The C. V. Mosby Company, St. Louis. 1938. Price, $12.50.

This book is too well and favorably known to need any encomiums. Its authorship sufficiently sponsors this, fifth, revision as to excellence and worth. The authors have not been unmindful of what has become obsolete and what is new and worth while.

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Handbook of Social Hygiene

Edited by W. Bayard Long, M.D., and Jacob A. Goldberg, Ph.D., respectively, chairman and secretary Social Hygiene Committee New York Tuberculosis and Health Association. Lea & Febiger, Philadelphia. 1938. Price, $4.

The current interest in the control and treatment of the venereal diseases and the various collateral problems which are involved, justifies the publication of this handbook.

This work does not confine itself to the solution of the many problems of diagnosis and treatment. In the field of public health control there are other problems which are social rather than medical. This text faces them all. The editors, from their experience with the medical, public health, research and educational problems are particularly qualified for their task. In its preparation they have had the cooperation of seventeen contributors, each a leader in his or her own field with wide experience in that phase of the subject to which each has been assigned. The result is a source book of the utmost value. It discloses the nature and extent of the disease and the problems and dangers to which the government is at last awake. It will assist in informing and directing those workers, both medical men and laymen who have enlisted in this important campaign. This handbook tells them exactly what they need to know.

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Clinical Methods: A Guide to the Practical Study of Medicine

By Robert Hutchison, M.D., and Donald Hunter, M.D., physicians to the London Hospital. 10th Ed. Paul B. Hoeber, Inc., New York. 1938. Price, $4.50.

An encyclopedia in small, handy format, bristling with useful information for both student and practitioner.

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Claude Bernard: Physiologist

By J. M. D. Olmsted, Professor of Physiology, University of California. Harper & Brothers, New York. 1938. Price, $4.

The only book length biography of Claude Bernard to appear in English during the present century, written by a man who not only appreciates Bernard as a physiologist but as a man whose studies were made under the greatest difficulties but who, nevertheless, won for himself the name of "father of physiology." The book is well written in a fascinating style, reading more like a novel than a trite record of one man's life. It holds reader interest throughout even though one is not a physiologist.